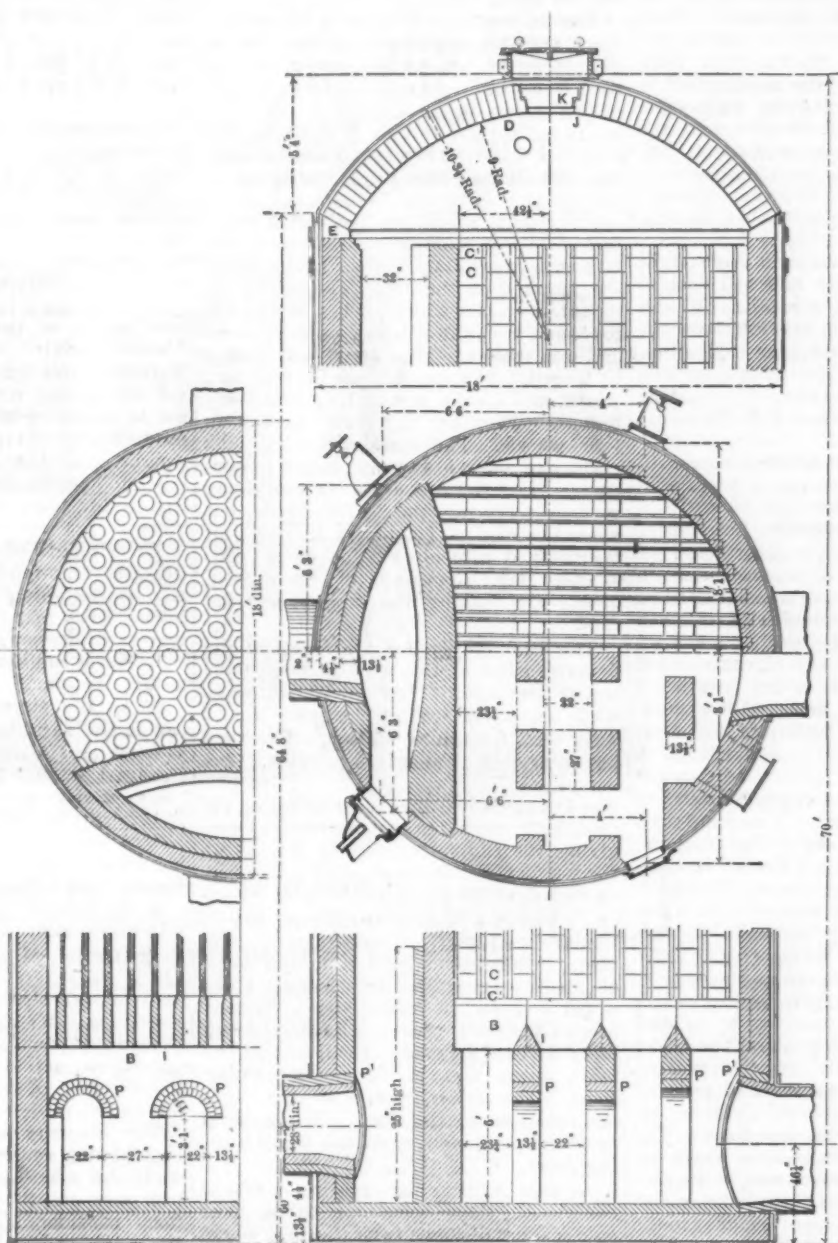


THURSDAY, JULY 10, 1890.

The distinctive features of the Cowper-Kennedy Stoves are well brought out in the accompanying drawing, in which C shows regenerator bricks 12 inches deep and C' regenerator bricks 6 inches deep, the latter being laid in the alternate rows in top and bottom courses, in order that the

coolest part, and there is a constant tendency to heat the regenerator uniformly whereas when the flame passes through the regenerator from bottom to top, if one part should be hotter than the rest the tendency is for the hot gases to seek the hottest flues and the difference is increased instead of diminished. For like reasons it is desirable that the air to be heated

without mortar, and by the peculiar method of interlocking the alignment of the flues is rendered very perfect. This makes it very easy to remove a few courses of brick at the top of the regenerator and renew them at any time, as the work can be done by laborers. The same system of building can be applied to regenerators with rectangular flues, but for the reasons



**THE COWPER-KENNEDY HOT BLAST STOVES.**

brick may break joint vertically and thus be kept in line. The only material change in this plan from that described in the Transactions of the American Institute of Mining Engineers is that the flues have been enlarged to 9 inches diameter, which experience has shown to be an improvement. In heating air by the Siemens system of regenerators it is desirable to have the flame traverse the checker work from top to bottom, for the reason that if one side of the regenerator should for any reason become hotter than the other the hot gases will have a tendency to go down the

should pass through the regenerator from bottom to top. These requirements are met by the Cowper type of stove. It has been found also by experience that a flue of circular section, owing to the absence of corners, does not accumulate nearly as much dust and keeps clean much longer than one of a rectangular section. As will be seen from the drawings, the flues of this stove are 9 inches in diameter and have no vertical joints, and horizontal joints 12 inches apart, which gives a very smooth flue with very little tendency to gather dust. The regenerator brick are piled in

giver: the round ones are preferred. These stoves are in use at the following places : Edgar Thomson Furnace, Braddock, where they have displaced all others ; the Soho Furnace ; the New Eliza Furnace, of Laughlin & Company ; the Lucy Furnaces, of Pittsburgh ; Cambria Iron Company, of Johnstown, Pa. ; Andrews Bros., Youngstown, Ohio ; Pottstown Iron Company, and others.

Mexican capitalists propose to construct a railroad from Mazatlan, on the Pacific coast, to the City of Mexico.

### The Pike's Peak Cog Road.

The cog road now being built from Manitou Springs to the summit of Pike's Peak, Colorado, is nearing completion, and it is expected that passengers may be carried to the top of the peak by August 1. This is the second attempt to climb this mountain by railroad, the first having collapsed in 1884 after six miles of grading had been done. The present company were organized by John Hulbert, of Manitou, who is the president and the moving spirit in the enterprise. R. R. Cable, of Chicago, the president of the Rock Island Railroad, is the vice-president; and other well known men are interested in the undertaking. Active operations were begun in February last by the contractors, B. Lantry & Sons, of Strong City, Kan. The chief engineer of the construction is T. F. Richardson, who has built some notable structures, among them is the Encomnacion Bridge on the Mexican Central Railroad, which is the highest structure of the kind in the Mexican republic. He also built the Canon Diablo Bridge, 225 feet in height.

The Pike's Peak road will have eight and three-quarter miles, and will cost to build about \$50,000 per mile. It will mount to a height of 14,200 feet above the sea, or about 8000 feet above Manitou, the starting point. The equipment will consist of three locomotives, six standard gauge passenger coaches and three flat cars.

The locomotives are of the famous Abt pattern, such as are used on the Swiss Mountain roads. They are being constructed by the Baldwin Locomotive Works, of Philadelphia, which concern has the exclusive right to their manufacture in America. The locomotive is constructed on an angle of 16°. The width of the cab is 9 feet 2 inches. The coal box holds 1 ton of coal and the water tank contains 600 gallons of water. The boiler flues are 7 feet long by 1½ inches, and are 176 in number, giving a heating surface of 475 feet. It has an unusually large steam dome to admit of a sufficient allowance of dry steam, since the steep grades cause the water to rise high in the boiler. There are two sets of water gauges, one in the front and the other in the back of the boiler, each set having three gauge cocks. The lever and throttle are both worked by a screw arrangement, differing radically in this from the ordinary locomotive. Three brakes can be applied from the engine, steam, hand and back pressure, or water brakes. The two former are to be used only in case of emergency. The water brake applies directly on the gearing wheels. The brake shoes are of grooved brass, thus giving a greater surface of resistance and a greater binding force. The coaches also will have gearing wheels on the axles, to which brakes may be applied by hand, which renders them independent of the locomotive in case of accident to the latter. The coaches are light, weighing only 5 tons, and it is thought that hand brakes applied in this manner will suffice to hold them.

The cylinders are 17 x 20 inches, with condensing oilers on the steam chest and plain "D" main slide valves. The steam ports are 14 x 1½ inches, with an exhaust 14 x 2½ inches. Bridges between the ports are 1 inch and the valve travel is 5 inches. The outside lap is ¾ inch and the inside lap is ½ inch. The "lead" is ¼ inch. The carrying wheels are 25 inches in diameter. The center wheels consist of three sets of cogs, with one tooth in full contact with the rack rail at all times and one just entering and another leaving. The center wheel has a pinion on the main driving shaft.

The gearing wheels are 71 inches in circumference and have 15 cogs, and the

pinion wheel is 53 inches and has 12 cogs, thus giving an action of 1½ to 1 on the gearing. The third gear is connected with the middle gear wheel by two parallel rods. The fire box has 20 feet of grate surface. Tanks to hold 2000 gallons of water will be buried along the road, and the engines will be supplied by stand pipes. The smoke stack is of the English pattern and 4 feet high. The rack or cog rails are 80 inches long, and are from 1 to 1½ inches in width, varying according to the grade. The T rails are 40 pounds weight and of Joliet make. The angle bars are very long, being 36 inches, with six bolt holes. The rack rails were manufactured at Johnstown, Pa., and cost \$12,000 per mile.

The delivery was delayed by the second flood, and this, together with the delay in delivering the locomotives, prevented the road from being opened in the early part of this season, as was expected. The ties are of red spruce, and are 9 feet long and 8 inches thick. They are planned to give them a uniform bearing. The spikes used will be 5½ x 1½ inches.

The road is single tracked with a road-bed of 15 feet wide in embankments and 20 feet in excavations. Four bridges only are required on the line. These span the mountain stream which rushes beside the road, and are built of heavy stone masonry and iron trusses. They are 20 and 30 feet in length. The coaches are of standard width, and are 43 feet in length between bumps. They are light and have only four wheels. The seats run across the coach and have a capacity for 50 passengers. Three flat cars are at present being used to carry material up the grade, but when the road is completed they will be transformed into observation cars. The Wason Mfg. Company, of Springfield, Mass., are making the coaches and flat cars.

The heaviest grades are found at the first two miles of the road and near the top of the peak. They are 25 per cent., while about half way up the grade is only 8 per cent. for a mile or more. The road has an average grade of 16 per cent. The curves are slight, varying from 2° to 16°. The locomotive always remains below the load, both ascending and descending, thus giving the engineer complete control of the whole train. Several runs will be made each day, and the "Sunrise" and "Sunset" trains reaching the peak at those particular times will be features of the service. A handsome depot is being erected at Manitou near the Iron Spring. The upper story is of frame with a balcony around the sides, the fourth side opening on to the carriage road. It will contain two office rooms and the women's waiting room. The lower floor is of cut stone and opens on to the track. It has three ticket offices, lunch room and men's waiting room.

At this writing the grading is almost completed, there remaining to be done only a short distance from the top, where the rarified air makes working slow and tedious. Ties and rails are being rapidly carried up the grade and placed in position by means of the engine and flat cars. The road, in fact, is so nearly completed that it is safe to make the assertion that before the end of this season what is probably the greatest effort of mountain rail-roading in America will be thrown open to the public.

The Chicago branch of the Erie City Iron Works, at 34 and 36 West Monroe street, has issued a neat little brochure illustrating and describing the company's economic boiler. This is a return, tubular, portable boiler, ranging from 10 to 100 horse power, claimed to be a rapid steamer, combining the convenience of a portable boiler with the safety of a stationary one.

### Malleable Iron in Car Construction.

At the Master Car Builders' Convention a report was submitted by a committee consisting of W. Forsyth, John Mackenzie and E. D. Bronner on the use of malleable iron in car construction which is well worthy of consideration. The following is an abstract:

Taking the weight of castings now used in a 60,000-pound car—say, at 3500 pounds—the reduction in dead weight would be 1400 pounds per car by the substitution of malleable iron. The durability of the material, on account of its greater strength, will commend it to those appreciating the cost of loss of service of cars on account of repairs to broken parts, to say nothing of the direct outlay of the renewal. The advantages of strength, lightness and durability being apparent, the question of cost arises.

Manufacturers state that for large orders for the building of cars, where the malleable iron would be used throughout, it could be produced and sold for 3 cents, or perhaps under that figure, per pound. Taking our weights of castings as above, the comparative cost would be per 60,000-pound car as follows:

3500 pounds cast iron at \$1.80.....	\$63.00
3500 pounds — 1400 pounds = 2100	
pounds malleable iron at 3 cents.....	63.00

Malleable iron scrap, however, is not so valuable as cast scrap, but malleable iron would greatly reduce the amount of scrap produced, so this question loses most of its weight. All the makers of the M. C. B. type of coupler have adopted malleable iron as the most durable and economical metal.

The strength of malleable iron castings depends very much upon proper proportion in designing the pattern. The following rules may therefore be of advantage to draftsmen:

1. Never run abruptly from a heavy to a light section.
2. As the strength of malleable iron lies in the skin, expose as much surface as possible. A star-shaped section is the strongest possible form in which a casting can be made. For brackets use a number of thin ribs instead of one thick one.
3. Avoid all round sections; practice has demonstrated this to be the weakest form. Avoid sharp angles.
4. Shrinkage, generally, on castings will be ⅜ inch to the foot smaller than the pattern.

The subject of this report is a general one, not accompanied by any specific instructions. We have therefore treated it in a general way, and the only matter requiring any action of the association is in the direction of standard forms for various details made of pressed steel.

The diversity of shapes and sizes for pressed steel centre plates and stake pockets is now almost as great as that for cast iron ones, and the subject should be further considered by a committee on "standards," so that these and other pressed steel details may be reduced to a few standard forms.

In conclusion, we desire to emphasize the following facts: 1. That malleable iron castings possessing strength and durability far superior to cast iron and weighing considerably less per car, can, by reason of reduced weight, be purchased at about the same cost per car. 2. That the price of iron and steel beams, channels and plates is now low enough to make it possible to construct a flat, box or coal car of greater strength and durability of equal weight at a cost very little in excess of a wooden car. 3. The use of pressed steel makes it possible to construct steel cars with few parts and with shapes or forms especially designed and adapted for car construction of a material possessing the greatest strength for a given weight. For



these reasons we believe that the extensive use of malleable iron and steel in the details of wooden cars will result in the gradual disappearance of wood, and that we expect in a few years iron or steel under frames and plate steel trucks will be generally introduced in the United States.

### Quick Return Drill.

This drill, as may be seen by consulting the accompanying engraving, is very simple in construction. In it the cones are large, the belts wide, the gears heavy, and the spindle is of cast steel with patented worm feed. There is also a patented device for disconnecting the worm from the worm gear, allowing the drill to be re-

ments, a combination heretofore unknown in the building annals of Chicago. The structure will probably be six stories high for its entire extent, but the State street side may be only four or five stories high. The ground floor will contain stores, the shop and the warehouse. The upper floors will be divided into apartments of a few rooms each, and single rooms. It is expected that most of the residence space will be used by employees of the firm, there being room enough for 300 families and forty individuals. The building will be well conducted, although economical methods have been employed so as to reduce rents to a minimum. Exhaust steam will be used for heating, and the company's electric plant will furnish light for the entire structure. All rooms and apartments

grades of steel are converted into high grades. Old Bessemer steel rails are converted into steel from which razors and surgical instruments are manufactured. The test was satisfactory.

### Changes in the Western Scale.

In considering the scale the following was added as a third section of the article of agreement: "All differences that may arise between workmen and mill owners shall be settled under the rules of the Amalgamated Association of Iron and Steel Workers, as explained in article 10, of 1889-90."

In the boiling schedule a change was made to allow Siemens furnaces 1400 pounds to a heat, and the extent of time for the heat, one hour and 55 minutes, to be reckoned from the time the door is dropped after charging until the heat is ready to draw.

The following is substituted for clause 3 of the boiling schedule:

When the majority of the furnaces in any mill require more than the time specified in clause 2 to make their heats, due notice, as described in clause 2, shall be given in accordance with article 10 of the Amalgamated Association of Iron and Steel Workers' constitution of 1889-90, and if after three days the mixture is not changed, then 50 cents per ton extra shall be paid for all hard iron thereafter made until the stock is changed.

The words "when worked alone" are added to clause 6 of the boiling schedule, and clause 14 is increased by "when it is no fault of the boiler."

In the fourth line of clause 1 of the muck or puddle mill schedule "base price" is substituted for "straight price."

Clause 3 of the scrapping and busheling schedule is changed to read: "Busheling scrap and wrought iron turnings mixed on sand bottom to be 30 cents per ton above the current price for piles on boards."

The following is added to clause 7 in the bar and nail plate schedule: "This shall not apply to mills giving extra help, provided no further help shall be furnished on piles or billets weighing less than 150 pounds." Clauses 8, 9 and 10 are stricken out. Clauses 1 and 2 of last year's scale are substituted for those in the new scale.

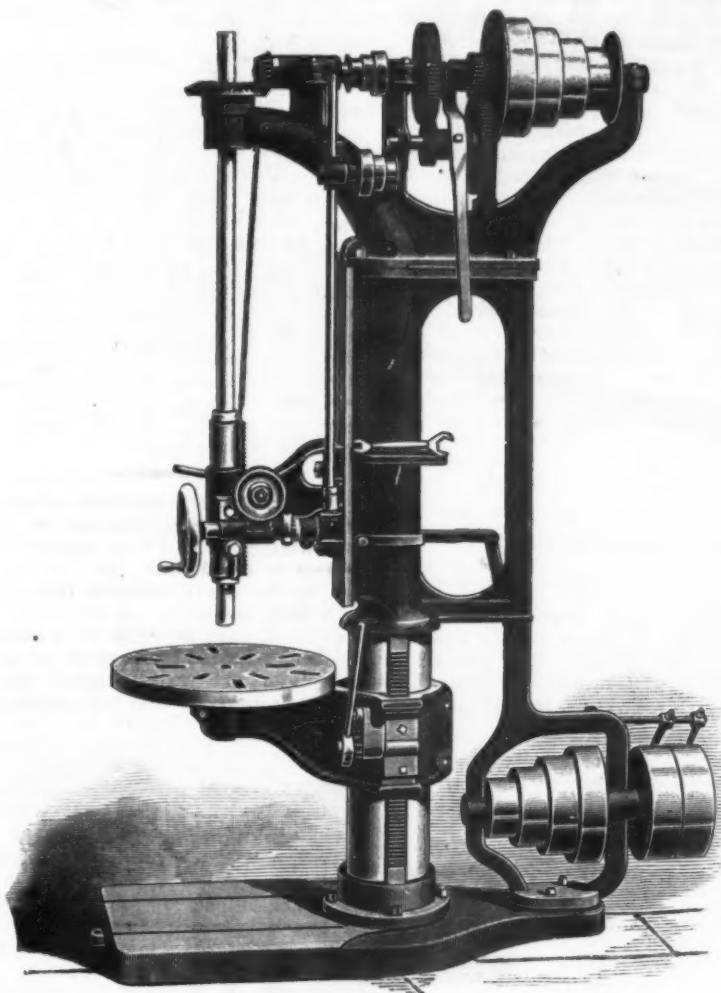
In the second line of guide, 10-inch hoop and cotton tie mills schedule, the words "night turn roller" are stricken out. It is understood, however, that this arrangement shall in no way detract from the authority of the roller in controlling all hands in the mill, including hiring and discharging as heretofore; the roller shall be held responsible for the work done.

In the third note, under hoop and cotton tie mills, the phrase at the end about steel billets is stricken out. After the word iron, in the second line of the same clause, the following is inserted: "All steel hoops made from 1½ inch and lighter reworked steel billet, all steel product from 1 and 1½ inch and lighter steel billet."

In the ninth note the average of the mill is changed to \$32 per day and rolling for a third rougher during June, July and August on demand of roller, rougher and catcher, the same to be paid one-half by roller and one-half by rougher and catcher.

Gross weight in changed to finished weight in the second note under the structural mill schedule.

A luminous buoy has been invented by M. Dibos, by which the sea is illuminated for a considerable distance. The light can be discerned 2½ miles away. It is produced by phosphuret of calcium, which flashes out as soon as the buoy touches the water.



QUICK RETURN DRILL.

turned very rapidly, thus saving a great amount of time in its operation, while an inexperienced workman can operate it without danger of getting it out of order. The machine is fitted with an adjustable and revolving table. The swing is 23 inches. The countershaft is attached to the drill and is designed to belt from the main shaft. The spindle is balanced by a weight in the post. The distance from the table to the end of the spindle is 34 inches. This drill is made by P. Blaisdell & Co., of Worcester, Mass.

A unique factory building is to be erected in Chicago for the Benjamin Machine Company. It will cover the block bounded by State, Delaware, Thirty-fourth and Thirty-fifth streets. The construction will be of brick, stone and iron, and the exterior decoration will be high grade. The building will contain a machine shop, stores, warehouse and apart-

ments, a combination heretofore unknown in the building annals of Chicago. The size of the lot is 235 x 265 feet. The cost of the improvement is estimated at \$350,000.

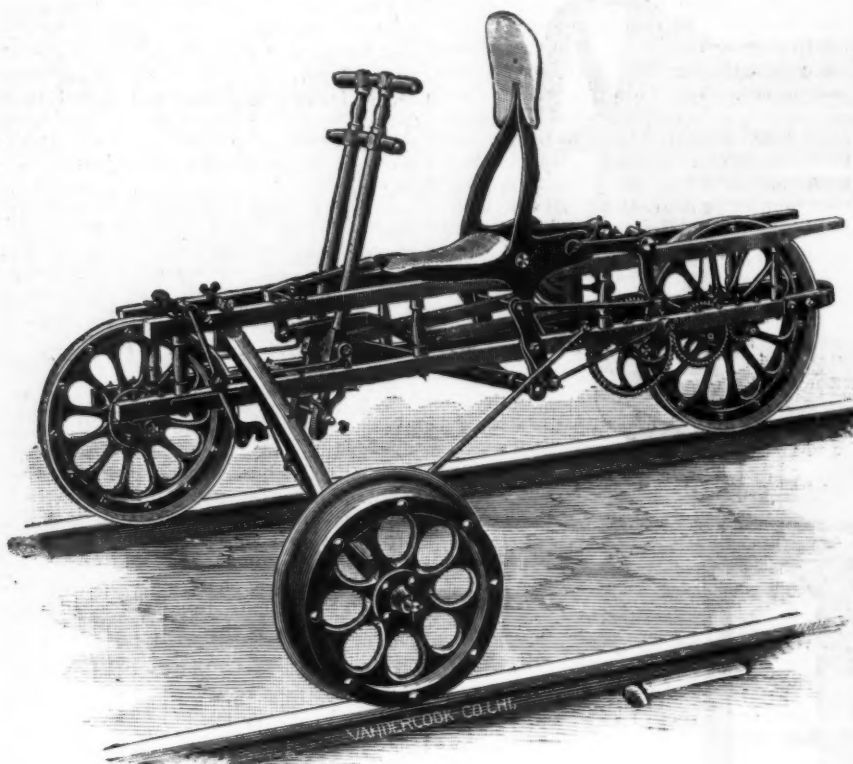
An exhibition of the Redemann-Tilford process of refining and improving steel was given at the works of the Troy Steel and Iron Company. There were present besides Vice-President William Kemp and other officers of the company, Col. Charles W. Hayes, of Washington, D. C.; H. H. Adams, president of the Hocking Coal and Iron Company, of New York; Walter J. Scott, of New Albany, Ind., superintendent of the New Albany Steam Forging and Iron Company; George H. Sellers, of Philadelphia, and Herbert A. Wright, of New York. Several of these gentlemen are directors of the Pennsylvania Steel Refining Company, under whose auspices the exhibition was given. By the process low

### Railway Velocipedes.

The object of this invention is to give the operator of a railway velocipede the advantage of his weight to assist in the work of propulsion. The accompanying

there which he had secured by the reclamation laws. When questioned recently about the success of the experiments, "They show that Florida can beat Louisiana two to one on sugar," was his reply, and he thereupon gave some specific

and new soil used or fertilization adopted. Louisiana fertilizes heavily. Cane in Cuba will ratoon for 12 years; in Louisiana two crops for one planting; in Florida they have six ratoons in full vigor and calculate therefore on that basis. Figuring on this foundation, the average cost of preparing and planting a sugar crop per acre per annum is \$18.18 in Cuba, \$24.38 in Louisiana and \$10.96 in Florida. The sugar produced per acre is 2992 pounds in Louisiana and 4037 pounds in Florida.



MANUAL MOTOR FOR RAILWAY VELOCIPEDES.

illustration shows the construction of the machine. The operator places his feet on the pedals, grasps the hand lever, and rocks back and forth. Levers connect with the crank in such a way that power is directly applied from these three sources. The motion of the operator's body is very easy, as the back of the chair travels but a few inches. The stroke for crank purposes is obtained by the aid of compound leverage, having a connecting rod attached to the top of the arm which swings with the lower part of the chair, and from which the pitman is connected with the crank. The hand lever power is connected at a point below the oscillating seat, acting reversely to the sway of the back, giving the rider the advantage of power both forward and backward. It will be seen that he is enabled to exert his maximum of power on the line from feet to shoulders. Motion is conveyed to the rear wheel of the velocipede by suitable gearing. An average speed of 15 miles per hour can be maintained, and those who have used the machine state that it can be operated with less fatigue than the railway velocipedes heretofore introduced. An adjustable seat and foot rest can be added for a second man. In this case he helps his companion propel the car by means of a handle fastened to the back of the oscillating chair. The same method of obtaining power can be applied to other conveyances for use on either land or water. This machine is put on the market by F. G. Holton, Room 517, Rookery building, Chicago.

Hamilton Disston, the wealthy Philadelphia manufacturer, at the instigation and in partnership with Claus Spreckels, the sugar king, began some two or three years ago an extensive experiment in sugar cane growing in Florida. Mr. Disston owned several hundred thousand acres of land

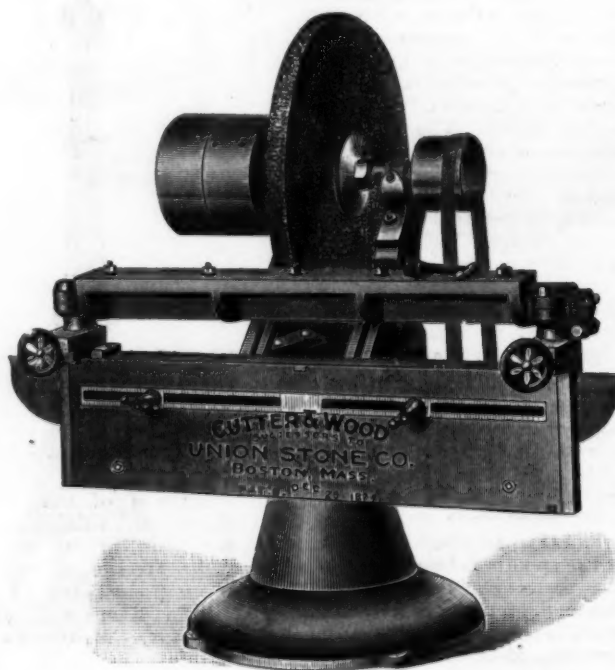
showing a marked improvement without any fertilization. Cuba uses maiden land that deteriorates 50 per cent. in 12 years, at the end of which period the crops become so small that the land is abandoned

can be made. I am going home," he continued, "to build a ship that will be a record beater for speed. I do not care if the Philadelphia has made 21 knots, we will beat her record."

### Automatic Knife Grinder.

The automatic knife grinding machine here illustrated is made by Cutter & Wood, of 35 Arch street, Boston, Mass., and is intended for grinding all kinds of machine knives. The knife bed may be revolved to any angle, to grind from a square shear blade to the longest bevel, or even to facing a knife. It is revolved by means of a worm gear at one end, except in the 24-inch machine, which has screw adjustment. After setting knife bar to the desired angle, it may be clamped in position by means of the friction heads in which it is centered. Both these heads swivel so that one end or the other of the knife bar may be fed up to the wheel without cramping. The wheel arbor is provided with sliding boxes, which, as the emery wheel wears away, may be lowered on the inclined planes, bringing the wheel nearer the knife bed, so that it may be worn down to a size even beyond the limits of economy. The speed is about 250 revolutions per minute, and the emery wheel measures 26 x 1 1/2 inches.

Irving W. Scott, president of the Union Iron Works, of San Francisco, in a recent conversation, said he is opposed to the system of speed tests, because they militate against the Government in every case. "No ship should be subjected to a high speed test," said he, "until her machinery has been adjusted for at least six months and been practically worked for that period of time, so that no possible strain



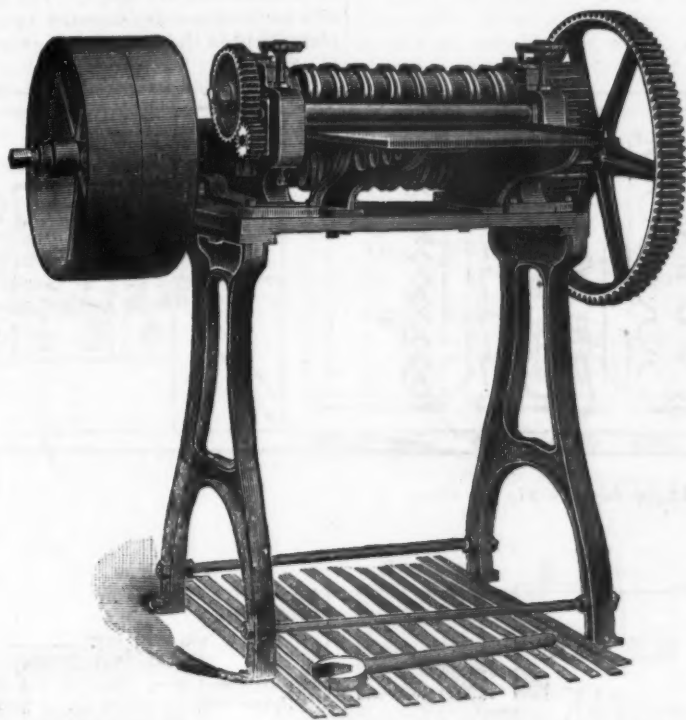
AUTOMATIC KNIFE GRINDER.



**New Gang Slitting Machine.**

The Niagara Stamping and Tool Company, of Buffalo, N. Y., have recently placed upon the market a new gang slit-

Ship Building Company has closed a contract for another large steel steamer to be built for parties in Sandusky, Kelly's Island, and Alpena. The new boat will measure 320 feet over all, 300 feet keel, 741



GANG SLITTING MACHINE.

ting machine, particularly designed for manufacturers of cans for fruits, vegetables, condensed milk, fish, soups, and also for dry substances, such as baking powders, spices, &c. The manufacturers state that as many pairs of cutters may be placed on the shafts as are required by the size of the blanks to be cut. The shafts are geared together, as are also the steel feed rolls at the front and at the back of the cutters. The cutters are made of the best English steel, ground true, are interchangeable and made in dimensions suitable to the work designed to be done with them. Strippers are provided in the rear to strip the metal and prevent it from curling around the collars. The machine shown in the accompanying illustration is a special one, although generally made for 14 x 20 and 20 x 28 tin. For straight work, such as may be required in tinware manufacture, for straight lard or butter packages, and within the dimensions named, it is applicable for a great variety of work, and will cut strips as shown in the engraving as well as others, both of greater and less width, by simply associating the cutters with necessary collars to proper thickness. The first machine turned out by the manufacturers was to the order of Clark & Cowles, of Plainville, Conn., who speak in high terms of the general satisfaction it has given.

The iron ore trade of Northern New York is severely crippled by the inadequate facilities for transportation on the Champlain Canal, which is crowded with the ice harvest, comprising 1,500,000 tons. In 1889 the ore shipped over the canal was 234,948 tons, and the preceding year 259,269 tons.

The Craig Shipbuilding Company, of Toledo, are about to build the largest steel freight carrying steamer on the lakes. She will have a keel length of 305 feet, a length over all of 325 feet, beam 44 feet, hold 26 feet. It is estimated that she will carry 3500 gross tons. The steamer is to be built for the market. The Cleveland

feet beam, and 25 feet molded depth. Her triple expansion engines will be 20-32-54, with a 40 inch stroke. She will have two Scotch boilers 12-4 feet by 13.



Fig. 1.—First Prize.

**The London Tower.**

Animated by a spirit of rivalry, and in the hope of large returns, English capitalists went into the scheme of building a great tower in London, similar in character to that which made the Paris Exposition famous. Rewards of 500 guineas for the best design and 250 guineas for the second were offered, among the jurors being some of the leading engineers and architects of Great Britain. Sixty-eight designs were submitted, from which the jurors chose the two shown in the accompanying engravings, the first prize being awarded for the design shown in Fig. 1, by A. D. Stewart, J. M. Maclaren and W. Dunn, all of London, while the second was awarded to John J. Webster and J. W. Haigh. The former is for a tower 1200 feet in height, having an octagonal skeleton 300 feet in diameter at the base. It is to be constructed of steel throughout, with steam elevators to the top. The second is an octagonal steel tower 1900 feet high, standing on a base 470 feet in diameter. Hydraulic elevators are to be used, and the lower part of the tower and the upper platforms are provided with buildings to be used for residential and other purposes. It will be observed that the first design follows in a general way the lines of the Eiffel Tower, while the second differs from it in several material respects. The jury, while acknowledging that quite a number of the designs contained good points, confessed with feelings of disappointment on the whole as to the result of the competition, there being no single design which they could recommend as it stands for execution. The result of the English competition certainly did not bring out any ideas or designs likely to be of any great value to those who might undertake the construction of a similar tower



Fig. 2.—Second Prize.

**THE LONDON TOWER DESIGNS.**

She will have a steel spar deck and three masts.

At and around Charlotte, N. C., there are 32 cotton mills, representing an investment of over \$3,000,000.

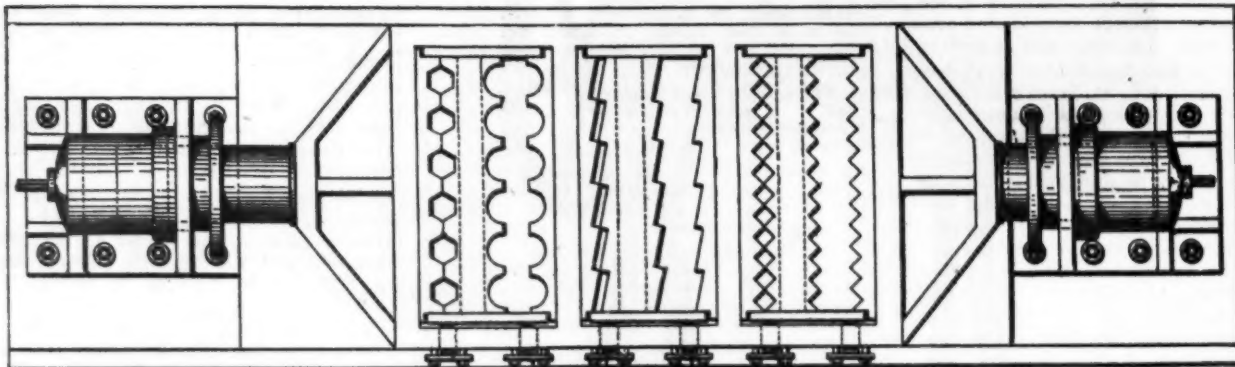
for the Chicago Exposition. It is clear that the merit of novelty has been taken from enterprises of this kind by the Paris structure, and any work in that direction is likely to be tainted with the reproach of imitation.

**Mold for Ingots.**

Although the apparatus, of which we herewith present drawings, is adapted for the production of comparatively large ingots, it can be modified so as to produce small ingots or billets. At the ends of the bed or foundation, as shown in the

formed integral with the sides of the frame or arranged to fit in grooves. Between the ends of the frame and the partitions next adjacent, and between adjacent partitions, when two or more are employed, is a dam or abutment which is stationary with relation to the frame and partitions. This dam, shown in Fig. 1,

opposite end against a tension plate, which is adjustably held in position by bolts. As these plates can be readily removed from the frame, they can be replaced without trouble in case of injury by contact with the metal. The opposite side of the frame is protected by movable plates held in the operating position in the



Mold for Ingots.—Fig. 1.—Plan.

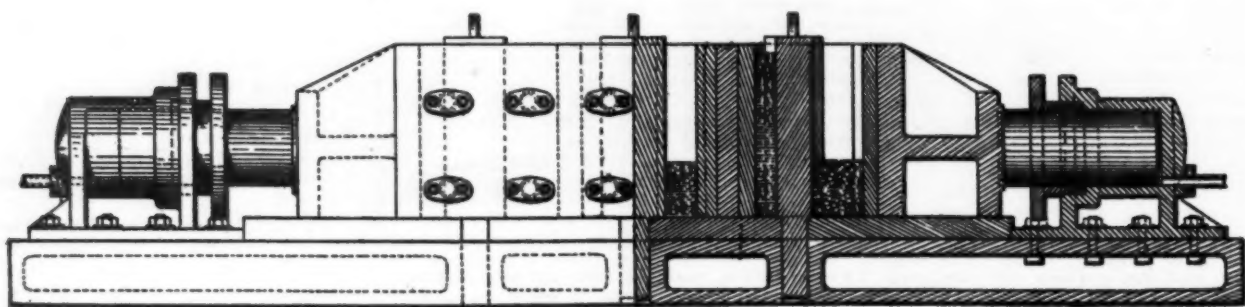


Fig. 2.—Side Elevation and Section.

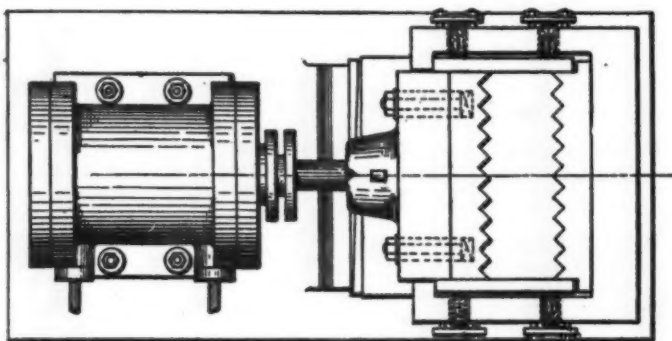


Fig. 3.—Plan for Making a Single Series of Ingots.

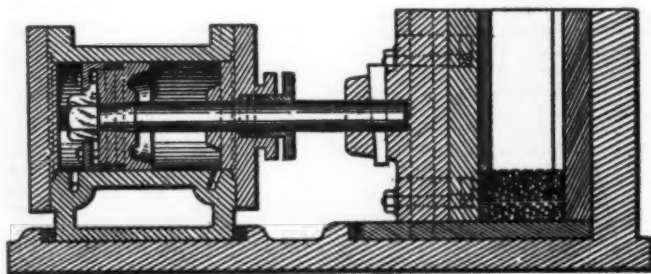


Fig. 4.—Longitudinal Section Fig. 3.

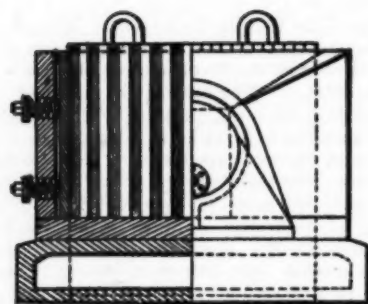


Fig. 5.—Cross Section Fig. 3.

plan and side views, Figs. 1 and 2, are secured fluid pressure cylinders, the pistons of which bear against the ends of a rectangular frame. This frame rests upon a plate or series of plates arranged upon the bed between the cylinders, these plates extending along the bed a sufficient distance to permit the movement of the frame. Within the frame are arranged one or more transverse partitions, either

is formed with a tenon fitting in the socket frame in the bed. In order to permit of the expansion of the dams when heated by the molten metal, and at the same time prevent the escape of the metal around the edges, yielding lining plates are placed along one of the sides of the frame and are held against the edges of the dams by springs, Fig. 1, which bear at one end against the plates and at the

same manner as the others. By making the springs sufficiently strong the proper adjustment to the several parts of the apparatus can be secured by means of the plates, as mentioned.

In casting ingots the frame is shifted by the proper adjustment of the controlling valves of the cylinders to the right, reference being had to Figs. 1 and 2, thereby moving the left hand end of the frame and its partitions into close proximity to its dams and moving the right hand end of the frame away from the dams, thus opening the matrices on the right and closing those on the left, which have previously been partially filled with molten metal. The cross sectional area of the metal in the left hand matrices is diminished and the depth of the metal increased by this movement of the frame and partitions, the metal nearly filling the matrices thus reduced in dimensions. Molten metal is now teemed into the enlarged matrices and the frame shifted to the left, thus closing these matrices and causing the metal therein to rise to a height proportionate to the amount of metal poured in. The movement of the



frame to the left opens the matrices first closed, so that the ingots can be removed. So far the apparatus is adapted for the production of large ingots.

In order to change it so that it may be applied for the making of small ingots or billets a series of projections, shown in Figs. 3 and 4, are formed on the faces of the end walls of the frame, and on the faces of the dams or abutments, the projections on adjacent faces being arranged in line with each other and extending into the matrices such a distance that when the matrix is closed, as described in the first case, the projections will come into contact with each other. The walls of the recesses formed by the projections can be varied in shape and arrangement in accordance with the cross sectional shape of the ingot desired. As, for example, the walls formed by the projections extending into the matrix are here constructed to form hexagonal billets, while the matrices in the first case are constructed to give a rectangular slab like shape in cross section. It is evident that the apparatus can be constructed to form a double series of ingot sections or only a single series, as shown in Figs. 3, 4 and 5. It will be noted that the partitions and dams or abutments divide the frame into a series of matrices or molds, each having a wall movable toward or from the opposite wall. The end walls of the frame in Figs. 1 and 2 form movable walls of the molds at the ends of the frame, the partitions forming the movable walls of the intermediate molds, the abutments or dams forming in both cases the stationary wall, except in the form of apparatus shown in Figs. 3 and 4, where the dam is the movable member. This mold is the invention of Henry Aiken, of Pittsburgh, Pa.

### SOUTHERN MISCELLANY.

Within the past several months every portion of the mineral region of the South has been thronged with prospectors, investigating mineral properties and securing mineral rights. Millions of dollars are being invested and a prodigious development will ensue. At Asheville the Western North Carolina Mining Company, with ample capital, were recently incorporated, with A. H. Fuller, of Brocton, Mass., as president; S. B. Eaton, of New York City, vice-president, and W. J. Jenks, of New York, secretary. In Laurel County, Ky., a company of Eastern capitalists have recently purchased 20,000 acres of Mineral lands, paying therefor \$100,000, and will develop. At Memphis, Tenn., the Zinc King Mining Company have been incorporated by J. W. Dollison, G. W. Goddard, J. F. Hunter and others. At Elizabeth, W. Va., the Little Kanawha Mining Company have been incorporated to develop mineral lands. Among those interested are S. B. Rathbone, Jr., F. D. Pomeroy and R. B. Bryant. Gen. William H. Mahone, of Virginia, has personally and through agents, made recently extensive purchases of mineral lands in Patrick County, Va. On the Houston iron ore lands, near Dalton, Ga., a party of Northern capitalists have gone to work and will develop the property. At Baltimore the Chesapeake Construction Company have been incorporated to engage in mining and manufacturing. The capital stock is \$100,000. The incorporators are E. J. D. Cross, G. W. Hauenbeek, H. L. Bond, Jr., and others. At Greensboro, N. C., the Luther C. Wolkins Corporation has been chartered, with \$1,000,000 capital, to develop North Carolina mineral land. The incorporators are Luther C. Wolkins, of Boston, Mass.; F. L. Whitcomb and W. R. Burgess. At Llano, Texas, it is announced that 30,000 acres of mineral lands are to be developed by the Wakefield Coal, Iron and Land Company. The undertakings here mentioned do not cover the entire list of enterprises of this character. They are the most prominent ones on foot, and are amply indicative of coming mineral developments of unexampled magnitude.

There is not only unusual activity in Southern railroad building, but especially in the erection by Southern railroads of more commodious and modernized shops and round houses than have been built in the South in years. At Macon the Georgia, Southern and Florida Railroad Company propose building machine shops and round house. There is hardly a single Southern railroad that is not

contemplating similar improvements of plant, while additions to rolling stock are continually going on.

At Alpine, Ala., the Wemoka Mining Company are preparing to develop iron mines.

At Brunswick, Ga., the Brunswick Foundry, Machine and Mfg. Company are building a foundry.

The new pipe works to be erected at Bessemer, Ala., will consist of a main building 410 x 414 feet, with a wing 160 x 114 feet; a machine shop 160 x 50 feet; a boiler house 30 x 60 feet, beside six additional buildings, each 40 x 150 feet. Work on these will be commenced shortly.

The Attalla Iron Company, of Attalla, Ala., will commence in a few days the work of erecting their proposed 100-ton coke furnace.

A. K. Rarig & Co., the iron manufacturers, of Columbus, Ohio, are reported to be negotiating with the citizens of Fort Payne, Ala., for the removal of their foundry and machine shops to Fort Payne.

The Maryland Bolt and Lock Nut Company, with a capital stock of \$100,000, have been incorporated at Baltimore, Md., by George Yellott, G. R. Shock, W. T. Roberts and others.

Eades & Wall, of Gainesville, Ga., contemplate the manufacture of a patent sash lock.

The Marion Iron Works has been organized at Marion, S. C., with W. J. Montgomery as president, R. Jordan, secretary and treasurer, and E. McDuffie as superintendent.

It is stated that the Sheffield Land, Iron and Coal Company have entered into an agreement with J. G. Chamberlain and others to build a rolling mill at Sheffield, Ala., that is to cost \$200,000 and will have a daily capacity of 100 tons.

Parties are working up interest in an iron foundry project at Cartersville, Ga.

A company headed by H. B. Tompkins have decided to erect a \$150,000 pipe works at Sheffield, Ala., on a site of 20 acres, donated by the Sheffield Land, Iron and Coal Company. The capacity of the plant is to be 150 tons per day.

With an authorized capital of \$75,000 the Harriman Hoe and Tool Company have been organized at Larriman, Tenn., and will build a plant that will employ 100 workmen. This new industry will be in operation by the middle of October.

The Bessemer Rolling Mill, at Bessemer, Ala., shut down recently to inaugurate a series of important repairs and improvements.

The hardware firm of Hawkins & Lambert, of Monticello, Ark., has been changed to Hawkins & Lambert Brothers.

J. A. George is erecting at Rome, Ga., a machine shop and foundry for general repair business.

At Washington, Ga., the Washington Foundry and Mfg. Company have been incorporated by Sims & Barnett, Flaker Brothers and A. W. Adams and others, with a capital stock of \$15,000.

The new pit which the South Pittsburgh Pipe Works were constructing has been completed.

At Houston, Texas, Alex. McGowen, the owner of the Bayon City Iron Works, has admitted his son, E. F. McGowen, as a partner, and the new firm name is now A. & E. F. McGowen.

The Chicawauqua Foundry Company, of Chattanooga, Tenn., have completed their new plant and have commenced operations.

The Tennessee Mining and Improvement Company announce their intention of building an iron furnace at Watauga, Tenn., that will be one of the largest in the South.

The capital stock of the Llano Improvement and Furnace Company, of Llano, Texas, has been increased to \$3,000,000, in order that they may be prepared to buy additional iron ore lands, erect a furnace and establish other industries. The furnace they intend building is to cost \$150,000, and the plans for the same are now being drawn by a Philadelphia engineer.

The West Nashville Furnaces, at Nashville, Tenn., will resume operations shortly, using the Cumberland banks ores. An additional hot blast has been added to each of the furnaces, and the combined output will hereafter be 150 tons per day. A new engine is now being put in position.

The exclusive control for Texas of the "Bass Contracting Chill," has been secured by the Dickson Car Wheel Company, of Houston, Texas.

The new buildings for the South Tredegar nut and bolt factory, at Chattanooga, Tenn., has been completed and the machinery is being put into position, and the plant will be in operation shortly.

The first steel nails ever manufactured in the South by the Gleason nail machine were turned

out at Fort Payne, a few days ago, by the Fort Payne Rolling Mill Company, who say they will be able to put nails into Chicago at \$1.50 per keg.

At New Orleans, La., Holloway & Gardes, Limited, have been incorporated as a company by Charles Holloway, Henry Gardes and others. They have an authorized capital of \$200,000, and intend manufacturing agricultural implements.

The foundations for the new furnace at Bristol, Tenn., are nearly completed, when the force of workmen will be increased to 500 men, in order to push the construction as speedily as possible.

The work of the building of the Southern Iron Works at Chattanooga is progressing rapidly. The heating furnaces are in position and ready for use. The Corliss engine is undergoing repairs, and will be soon ready to put into place. The open hearth furnaces are nearing completion, and when in operation the company expects them to have an output of 500 tons of finished steel per week. Already the machine shop is in working order. They hope to be melting steel by the middle of September.

### Boilers for the Monterey.

The Secretary of the Navy will, in a few days, enter into a contract with Charles Ward, of Charlestown, W. Va., for four tubular boilers to be built under his patents for the coast defense vessel Monterey, now being built at the Union Iron Works, San Francisco. The contract provides that three-fourths of the power for the vessel shall be furnished by tubular boilers, and the Ward boiler has been decided upon, after a thorough competitive test. All makers of coil and tubular boilers in the country were invited to submit boilers for this test, but the only competitors were Charles Ward and William Cowles, of New York. Cowles proposed to furnish the required power with six boilers, each having 47 square feet of grate surface and 1998.5 square feet of heating surface, and weighing, in steaming condition, 12.65 tons. Ward proposed four boilers, each having 74 square feet of grate surface and 2938 square feet of heating surface, and weighing, in condition for steaming, 15.80 tons. The Ward boiler tested was considerably smaller than this. It had 53 square feet of grate surface and 2473.5 square feet of heating surface, the ratio of heating surface to grate surface being 46.67. In the Cowles boiler this ratio was 43.12. The trial was of 24 hours' duration and the boilers were worked under 160 pounds pressure, with 2 inches air pressure in the fire room. The trial board, of which Chief Engineer Loring was senior member, spoke very highly of the performance of both boilers, but found that the Ward boiler was best fitted for use in the Monterey. The four boilers will supply about 4500 indicated horse-power. The rest of the steam for the vessel will be supplied by two ordinary navy boilers, to be built by the contractors.

The estimates of population thus far published from the leading cities of Ohio and Illinois indicate a pretty close contest for third place in the list of States. Ohio has held the third rank since 1840, when it had 1,519,467. In 1870 it had 2,665,260 and Illinois 2,539,891, showing a margin of 125,369 in Ohio's favor. In 1880 Ohio had 3,198,062 and Illinois 3,077,873, Ohio 121,189 ahead, but showing about an even race as compared with 1870. During the last ten years Cincinnati, Columbus, Cleveland, Chillicothe, Canton, Dayton, Toledo, Youngstown, Akron, Zanesville, Newark, Springfield, and other Ohio cities have made heavy gains, while gains outside of Chicago are confined mainly to the comparatively small cities—Peoria, Quincy, Rockford, Aurora, Springfield, and Joliet. It is possible Illinois may take the place which Ohio has held for the last 50 years.

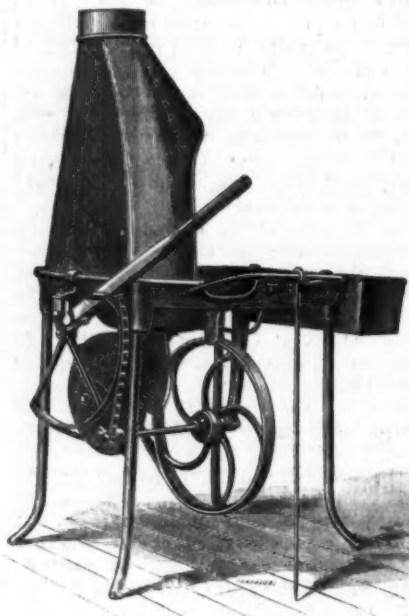
### Hand Blower and Forge.

The engravings here presented represent a new universal forge and a new hand blower recently placed on the mar-

railroads were built into the town. The Contact runs through Pitkin County from northeast to southwest, a distance of 40 miles, and is now being worked a distance of five miles with Aspen as a center. The ore is found in a Contact lode. The foot wall is dolomite lime-



UNIVERSAL HAND BLOWER.



UNIVERSAL FORGE.

ket by the Empire Portable Forge Company, of Lansingburgh, N. Y. In both these machines the novelty consists in the driving device, which is strong, positive and durable, and at the same time extremely simple in construction. Attached to the periphery of a segmental wheel, which is operated by the lever, is a chain passing around a sprocket wheel on the intermediate shaft. The forge is especially adapted for all kinds of heavy carriage and blacksmith work, having a large firepan with sufficient blast for the heaviest kind of work. The blower is made with a wrought iron frame, and is without wood or leather, except the handle and belt. When worked by hand it gives blast enough for two fires.

### WESTERN MISCELLANY.

Colorado has been called the Pennsylvania of the West, both on account of the deposits of iron ore which are found throughout the State, and the large beds of coal which are known to exist in various sections. One of the largest of the miners of coal at present in the State is the Grand River Coal and Coke Company, whose main office is at Glenwood Springs, in Garfield County. This company are working four separate mines at present at New Castle, Sunshine, Marion and Spring Gulch. The New Castle mine is the largest of the four, and it has a vein of bituminous coal running 45 feet through at right angles to the foot wall. This is one of the heaviest deposits of bituminous coal. The extent of the vein has not been ascertained, but it is thought to be of great length. This mine is on the line of the Colorado Midland Railroad, and it crops out of the side of the mountain and slopes downward at an angle of 45°, so that it is only necessary to run a tunnel through the vein and haul the coal to the mouth of the pit, where it can be dropped into the cars. The present production of the mines is 600 tons per day, but if necessary the output could be increased. The company also own 200 coke ovens at Cardiff, on the Midland Railroad, which have a capacity of 4000 tons per month. This coke has a less firm structure than the Connellsville coke and breaks into smaller pieces, and cannot carry the load that the Eastern coke can, but it is claimed that it contains more carbon and makes less ash in burning. It is said to contain from 86 to 90 per cent. of pure carbon.

The richest mining camp in Colorado, and one of the richest in the world at present, is Aspen. Silver was discovered here in 1879, another town was founded in 1880, but it was not until 1883 that pay ore was discovered. In 1887 the Colorado Midland and the Rio Grande

stone and the hanging wall is locally termed blue limestone. But little ore is found on the surface, deep mining and heavy machinery being required. Three varieties of ore—baryta, lime ore and lead ore are produced. The ship-

There are at that place 30 dividend paying mines, of which the best known are the Aspen Compromise, Aspen Smelting and Refining Company, J. C. Johnson, Park-Regent, Bushwacker, Justice, Last-Dollar, Celeste and Edison. The production prior to the advent of the railroads in the fall of 1887 was \$6,000,000. In 1888 it was \$5,620,000; in 1889, \$7,250,000, while the estimated production for 1890 is about \$9,000,000.

The greatest producer in Aspen, and, in fact, in the State, is the Aspen mine, which produced prior to July, 1885, \$1,500,000. From that time to May, 1888, the property was tied up in litigation, while from the latter date until June 1, 1890, there has been paid out in dividends \$2,550,000.

The ore from the Aspen and the Compromise mines is sent down the mountain on a private wire tramway. The Aspen Smelting and Refining Company control a public tramway from Aspen to Fourtelette Park, which is 10,000 feet long, with a rise of 2500 feet in that distance. It was erected by the Trenton Iron Company, of New Jersey, and is built on the Bleichert system. It has been in operation about three months. The Aspen Smelting and Refining Company were the first to introduce the electric hoist, in 1885. They are operated under ground where a steam hoist could not be used, and they give entire satisfaction.

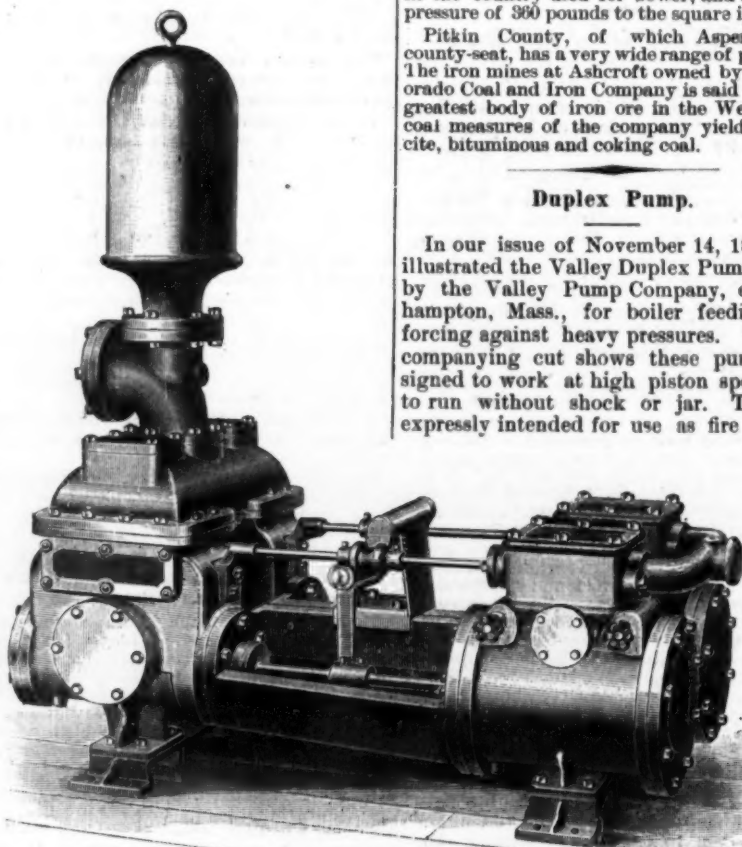
They use the Sprague system and are operated by dynamos run by water-power a mile distant. It is the intention of the Compromise Company to put in a tunnel, running through the Aspen Mountain, a distance of 3000 feet, to their mine, by which ore can be hauled on tram cars to a chute running to the railroad tracks, thus avoiding the expensive and inconvenient wire tramway. The tram cars are to be hauled by electric locomotives, and electric hoists are to be used throughout. In fact it is the desire of the Company to make electricity perform all the work possible. Work has commenced, and a company have been organized to furnish water power necessary to run the dynamos.

Aspen has an abundance of cheap water power. The plant which supplies the city with electric lights has a pipe leading down the side of the Smuggler Mountain, with a direct fall of 900 feet. This is the second greatest fall in the country used for power, and it gives a pressure of 360 pounds to the square inch.

Pitkin County, of which Aspen is the county-seat, has a very wide range of products. The iron mines at Ashcroft owned by the Colorado Coal and Iron Company is said to be the greatest body of iron ore in the West. The coal measures of the company yield anthracite, bituminous and coking coal.

### Duplex Pump.

In our issue of November 14, 1889, we illustrated the Valley Duplex Pump, made by the Valley Pump Company, of East-hampton, Mass., for boiler feeding and forcing against heavy pressures. The accompanying cut shows these pumps designed to work at high piston speed and to run without shock or jar. They are expressly intended for use as fire pumps.



THE VALLEY DUPLEX PUMP.

ments average 60 ounces per ton, with 15 per cent. of lime lead. The volume of ore shipped from Leadville is greater than from Aspen, but the former has superior facilities for smelting which allows a greater amount of low grade ore to be shipped. There is also produced in Leadville a large tonnage of iron ore and lead, but in actual value Aspen leads.

The port and valve areas are very large. The water cylinders are cast entirely separate, and connected by a short pipe. The water valves are very easy of access, and the whole machine is especially designed for this work.



## THE BOILER MAKERS.

Last week, in our report of the convention of the American Boiler Manufacturers' Association, we merely gave an outline of the proceedings at the first meeting, held on the morning of July 1. The present report will include the entire meeting, giving, of course, only the more important features, and no attempt will be made to divide the convention into days, for the simple reason that many subjects came up at one session and were continued to the next and following sessions, and some of them received no conclusive action. Our report, therefore, will be more like a summary of the work done after 12 o'clock, July 1.

The report of the Committee on

### Boiler Setting,

of which James G. Mitchell was chairman, was received and the committee continued. This report was one of only two or three which were presented in anything like complete form, and this showed that the committee had done all in their power to advance the subject. They had, as will be seen by the following synopsis, prepared a series of questions which were sent to the members, and to which only three replies had been received. These questions cover the subject of boiler setting as far as it could be covered by the committee, and the statements sent to the several members requested that they would not only answer the questions presented to them, but that they would also send in such further questions bearing on the subject as might, in their judgment, seem of importance. The replies herewith presented were received from President James Laffan:

### Questions and Replies.

1. What do you consider the proper distance for boiler above the grate surface? and has this distance any fixed relation as to the area of the grate and the quality of fuel used? A. Distance from grate to underside of boiler 20 inches to 24 inches for coal. There is no relation between grate surface and this distance. For wood this distance should be not less than 28 inches to 32 inches.

2. What sized openings should the grate surface contain for different grades of fuel? A. The openings between grate bars should not be less than  $\frac{1}{4}$  nor more than  $\frac{1}{2}$  inch for coal. For wood and peat coal  $\frac{1}{2}$  inch to  $\frac{3}{4}$  inch is wide enough.

3. What proportion should grate surface bear to heating surface for different grades of fuel? A. The grate surface should not be less than one-fortieth of the heating surface, but the larger the same is the better the result will be. For locomotive boiler the grate surface can be made somewhat smaller, but should not be less than one-sixtieth of the heating surface. Don't think there is any relation between heating surface, grate surface and fuel, the difference in fuel only requiring a difference in the grate openings. Do not think there exists any relation between length of boiler and length of furnace or grate under same. The length of grate should never be over 7 feet, as it is impossible to keep the same clear at the inner end.

4. What is the maximum length of grate that you would recommend for use with-out center rests? A. Five feet.

5. Have you had any experience with shaking grates? A. Yes, sir. Don't think very much of same, as they are very easily put out of order by pieces of cinders getting between the bars or into the shaking mechanism, thus causing breakage of bars and frequent repairs.

6. Have you had any experience with automatic stoking apparatus? A. No, sir.

Think, however, that for some grades of fuel they are indispensable, such as coal, slag, sawdust, tan bark and some sorts of peat coal, when they give a bright clear fire with little or no smoke.

7. Should air be introduced at the bridge wall? If so, state how. A. No. If the fuel is not put on the grate in too thick a layer no necessity for such introduction of air is needed. It is a fault met with everywhere; that whenever more steam is required the fireman fills up the grate with coal till it sometimes reaches the bottom of the boiler, thus frequently causing bagging of fire sheets, besides very heavy smoking of the stack.

8. Do you advise bridge wall to be straight or curved parallel to the boiler? A. Bridge wall to be straight. A curved wall has the tendency to concentrate flame and heat under center of boiler, as the flame will take the shortest way back to stack—i. e., over the lowest part of the fire bridge.

9. What should be the thickness of bridge wall at top and bottom? 10. Should bridge wall be sloped or vertical? A. Bridge wall should not be less than 18 inches at bottom, but may be tapered off toward top to 9 or 13 inches. Do not think it makes any difference whether front of bridge wall is sloped or vertical.

11. Should the space behind the bridge wall be reduced or enlarged? State reason. A. Space behind bridge wall should be enlarged, as it will reduce the velocity of fire gases, and thus have them give up more of their heat to the boiler.

12. Do you think it advisable to take air in at any point back of bridge wall? A. No. The temperature of the gases is too low there to ignite any smoke that may have formed over grate. Hence it can have no other than a cooling effect.

13. In what place should fire brick be used? and in lining furnaces with fire brick should they be tied to the main walls or built independently, or do you prefer that the brick be laid in Flemish Bond? Should the joints be made thick or thin? A. Fire brick should be used in all parts of the setting which are exposed to the hot gases. It is better to have fire brick lining tied in with red brickwork, unless the lining is made 13 $\frac{1}{2}$  inches thick, when it can be built up separate from outside walls. This arrangement will require very heavy walls. As usual but 9 inches fire brick lining is used in the fireplace and 4 $\frac{1}{2}$  inches behind the bridge wall. Joints in fire brickwork should be as thin as possible.

14. What should be the depth of the ash pit? And what rule would you follow in determining said depth? A. Depth of ash pit is generally determined by local circumstances. Think it does not matter how deep or how shallow an ash pit is, as long as it is kept clean, so as to give the air necessary for combustion free access to the grate. A deep ash pit has the advantage that it does not need cleaning so often. As a general rule the ash pit is level, or nearly so, with the floor on which the fireman stands, and as for convenient firing, the grate should not be higher than 28 to 30 inches; the depth of ash pit is thereby determined.

15. Should the ash pit be level or inclined? And do you approve of water under the grate? A. It makes no difference whatever whether the ash pit is level or sloping from or towards the bridge wall. Water in the ash pit may be of use on river steamers to reduce the danger of the woodwork taking fire. An advantage claimed for water in the ash pit is: By the dropping of hot ashes and cinders from the grate into the water, steam is generated, which, in passing through the hot coal lying on the grate, is there divided into oxygen and hydrogen, thus helping the combustion.

16. Should the grate surface be level or inclined? A. Do not see any advantage in inclining grate bars, unless a so called cinder grate is used, on which the cinders finally land, and which is so arranged that it can be dropped, thus throwing the accumulated clinkers into the ash pit. An arrangement like this will reduce the labor of the fireman in cleaning grates considerably, and also prevents the introduction of cold air under the boilers while the fire doors are kept open during the latter process.

17. Should the boiler be set inclined or horizontal? A. Boiler should, as a rule, set horizontally, or nearly so. They may be set a little lower at the rear end, so as to facilitate the draining of the same.

18. What do you consider the best mode of suspending the boiler? (a.) Brackets on sides resting on walls? If so, should same be fitted with expansion rollers and plates? How many lugs do you recommend for each side of boiler? Also shape and location for greatest strength? (b.) Suspending from cross-beams above boiler by two hook rods on each beam from eyes or lugs on each side? (c.) Suspension from a center? (d.) Do you consider wooden beams in this connection a source of danger? A. Side brackets resting on masonry may be used for short boilers. If used on long boilers, side plates or expansion rollers should be used at one end of boiler. There ought to be not more than two brackets on one side, so divided that the distance between them is about three-fifths of the total length of the boiler, or the distance from ends of boiler to center of bracket is equal to one-fifth the length of boiler. Long and heavy boilers are best suspended from two beams or girders by two or three bolts at each end. Boilers over 40 feet long should have three or even four sets of hangers, as the case may require. Both hanger bolts being quite long and provided with heavy spiral springs, so as to make allowance for expansion and contraction. Wooden beams or girders used for supporting boilers are not necessarily dangerous if kept far enough away from masonry. In these days of iron and steel, wooden girders should not be recommended, however.

19. How should the tops of boilers be protected? Is there any objection to a plain brick arch? or, should there be an air space? or, should such space be filled with cinders? A. The tops of boilers are best protected by light cast-iron plates laid over the top of same and resting on the side wall. These can easily be removed so as to allow a frequent inspection of this part of the boiler. Brick arches, in case of a leak, have to be torn away and then rebuilt again. Cinders filling in between brickwork and boilers are dangerous unless granulated blast furnace cinder is used. Cinders from boiler or blacksmith's fire are very sulphurous and consequently have a high tendency to form rust, particularly where there is heat and dampness at the same time.

20. Do you approve of outside and inside wall for the boilers with an air space between? If so, state proper thickness of inside wall on side, outside wall on side, inside wall in rear, outside wall in rear, air space between side and rear wall, thickness of wall between two or more boilers, also proper air space for same. A. Where plenty of money and room is on hand boilers may be set with air spaces between the walls. No wall should be less than 9 inches thick, with 3 or 4 inches air space between them. If boilers are supported by side walls, the outside walls should be 13 inches thick and have pilasters where the boiler is resting.

21. How should the walls be stayed? A. Unless boiler walls are very heavy,

they should be stayed by cast or wrought iron buch-stays, held together by rods at tops and bottoms.

22. What is the proper distance from boiler to inside rear wall to admit accessibility to the tubes and proper area for currents of gases? A. The distance between the rear head of boiler and brickwork should not be less than 12 inches.

23. How should the back connection be made? With tee bars or by arching? A. Connections between rear end of boiler and brickwork is best made with cast iron plates or fire-brick, suspended, when boilers are suspended, as the expansion and contraction will destroy an arch in short time. If resting on mud-drum stand, this connection can be arched, as the rear end of boiler will remain stationary in this case.

24. Do you know of any reason why flues touching the boiler above the water space should not be emphatically condemned? A. No.

25. What do you consider the proper area for flue for single boiler? State what rule you would follow in determining this question. A. Do not understand this question.

26. Have you had any experience with automatic damper regulators? A. No.

27. Is it, in your opinion, dangerous to have large spaces in which gases may collect for sudden ignition, producing the so-called "back draft"? A. Yes.

28. In case two or more boilers are directed into the same flue, should any provision be made for diverting the draft for each individual boiler? A. If the drafts from the different boilers come in the same direction, or nearly so, no special provision of this kind is necessary, but if the draft enters from directly opposite directions a center wall should be provided.

29. Do you think it is good practice to use auxiliary pipes in furnaces or flues for heating water? A. No. Unless they are so placed that they are easily accessible, as it happens quite frequently that these pipes choke up with scale.

30. State proper height and area of stack, and the method you would follow in determining same. Also state whether you would prefer octagonal or square brick stack, and how should it be lined? A. Area of stack to be not less than three-fifths of the total area of grate openings, and height not less than 40 feet; 100 feet is high enough for any boiler stack, provided the area is large enough for the work that is required of it.

31. What is the proportion of the area of the space over the bridge wall compared to the grate surface?

32. What should be the ratio of grate to tube area for the different grades of fuel for forced and natural draft?

In the discussion following the presentation of this report, Mr. Dunden, of San Francisco, stated that it referred only to one class of boiler, namely, cylinder-tubular boiler, and that this, in the opinion of the speaker, was the poorest boiler made. Mr. Raynal, a member of the committee, explained that the report was only a record of the doings of the committee, and that it was not intended to be final, and that it only partially covered the ground. The questions were sent out with the belief that the answers received would aid the committee in formulating correct rules for setting boilers.

Mr. Rohan stated that the report was supposed to cover externally fired boilers, and was not applicable to locomotive or marine boilers. It was not a report, but only a series of questions to be sent out and to really precede the presentation of a final and thorough report. The report was received and ordered printed.

#### Topical Questions.

Mr. Raynal here introduced a new feature in the meetings, one borrowed from

the Society of Mechanical Engineers. He explained the varied and valuable information brought out by the presentation of so-called topical questions, stating that these questions, brought up in the intervals of business as time allowed, had resulted, in that Society, in bringing forth much useful knowledge of a sort particularly valuable to those interested in the subject under discussion. He therefore presented as the first question the following: "Have you had any experience in welding plates, and how did you do it?"

Mr. McCormack stated, "I have had experience, and say, don't do it; it don't pay."

Mr. Dunden stated that he had welded steel plates; had then tested the boiler with satisfactory results; had noticed that the joint was free from scarf on both sides, but as it was to go to a place where no doubt must exist in regard to its strength, it was thrown away.

The other questions which elicited no discussion were as follows: "What has been your experience in welding plates for furnaces and other places under compression?" "Have you had any experience with vertical bending rolls, and if so, what?" "What rolls are made to roll 1 or 1½-inch plate to a 36-inch circle, cold?" "What plan would you advise to produce better workmen in our trade?"

The latter point brought out an animated discussion, which cropped out during the succeeding sessions of the convention.

Mr. McCormack said that the apprentice system was the only school in which to educate practical boiler makers, and that some standard of service was needed and some set time should be made compulsory in order to turn out a journeyman boiler maker. He said that he was an apprentice to the trade at 15.

Mr. Dunden said that it was difficult for a boy to get into a machine shop, but that it was not difficult to get into a boiler shop. In the former the boy was in some cases sharply questioned in regard to his previous education and examined as to his present adaptability. He thought the boys entering the trade who had no education whatever should be compelled to go to some night school.

It was here explained that the Steam-fitters' Union has a rigid system of examination, and that the journeyman belonging to the union is accepted by the employer as being a good workman, since he is practically vouched for by the union, and that, therefore, the employers are in favor of the union, since it gives them better men.

Mr. Garstang said that he had made his own mechanics out of boys in his own shop, and had had the satisfaction of losing them to rival concerns as soon as they were finished.

Mr. Marshall said that in 1855 he was bound out to serve a seven years' apprenticeship, here in this city, in the Novelty Iron Works. At the end of his apprenticeship he was to receive \$100 and a suit of clothes. He received a stipulated sum upon entering the apprenticeship, with the understanding that this was to be advanced from time to time, and that if his wages were advanced before the time set in the agreement, he was to have the benefit of a three months' deduction from the time of his service for every such advance before time. He thought it was necessary to elevate the character of the men and boys employed, and to do this it was necessary on the part of the employer and foreman to exercise a careful watchfulness. In reply to a question, he said that he endeavored to do this in his own business, and also to instruct his boys in all branches appertaining to boiler making, and to so question and take an interest in them as would advance them rapidly along the line. He thought that it would

not be well to make the time of apprenticeship too short, as it would run the risk of turning out only half boiler makers. He thought the time of apprenticeship should at least be five years, and that seven years would be better.

Mr. Raynal objected to the number of years' service, thinking that three years' revolving around the shop to qualify as a journeyman, and then four years more to become a master workman would be sufficient.

Mr. Rohan said that the place to teach boiler making was in the office. Teach the boy what he should but don't know in that way; and he also thought that it was a mistake in placing the boy, upon entering the shop, in the most degrading position, and thought it resulted in turning out too many heaters, riveters, etc.

#### Testing Plates.

A letter was received and presented to the meeting from the Pittsburgh Testing Laboratory, Hunt & Clapp, who offered to look after the boiler plate at the various mills, charging 50 cents per ton for such inspection when the order was 10 tons or over, and when the order was for a less number of plates, to charge \$2 per coupon, the association, in placing such orders for steel with the various mills, to place the orders subject to the inspection of the Pittsburgh Laboratory. The company guaranteed that the inspectors would carefully inspect the surface of every plate, see that it was cut to the proper size, was of the proper thickness, and would then stamp the plate with its mark. It would also make a test of a plate to represent each melt, and as many tests as might be ordered by the member, the test to include tensile, bending and drifting, the drifting to be a ¼-inch hole, 1½ inch from the edge, the hole to stand drifting to 1½ inch without fracture. The tensile test, strength, elastic limit, elongation, reduction of area, &c., to be ascertained.

Mr. Kent, the representative of the Pittsburgh Laboratory, explained in regard to this offer the capacity of the works he represented. There were only two ways to make a test of plate. First, to make it yourself, by sending your own man to the mill; second, to leave it to the mill, and take their statement in regard to the quality of the plate. He said that his works would make any chemical tests required, and would assist in the determination of incrustation, scale, analysis of water, &c. The inspection would be sufficient to conform to the association's specifications in regard to steel, as presented at the Pittsburgh meeting. The report was received and filed.

Mr. Kent further explained that the specifications for the United States boats Chicago and Dolphin had required 25 per cent. elongation and 60,000 tons tensile strength. These requirements had never been known before, and many refused to bid on the work; but the result was that the steel makers had improved the grade, and that the requirements then brought forth had been fulfilled, with the result that the best steel had gone into those two boats. In regard to the quality of material and the specifications which were adopted at the Pittsburgh meeting, and which called for a tensile strength of 55,000 to 65,000 pounds to the square inch, an elongation of 25 per cent. and not more than 0.035 per cent. of phosphorus, Mr. Raynal stated that "within a month I sent an order to Messrs. Carnegie, Phipps & Co., and they declined to fill that order, simply because it contained a chemical test." The letter he received from them and the contents of which were presented at a latter session, stated: "We as a rule object to quoting upon steel subject to both physical and chemical requirements. The steel maker has his only leaway in the chemical requirements, and prefers to



make these requirements himself, because as a rule specifications are made by impractical steel makers, and the physical and chemical specifications do not agree."

Mr. Hunsiker, the representative of Carnegie, Phipps & Co., who was present, immediately telegraphed his firm, and received an answer stating that there was some misunderstanding about the case, and that they had never intentionally refused to bid on steel conforming to the specifications of the American Boiler Manufacturers' Association.

Mr. Marshall said that the first thing to do was to live up to the resolutions made in 1889. He further said that he doubted if any boiler had been made in accordance with the brand of the A. B. M. A. The boilermakers, therefore, do not live up to the standard. It was first necessary to do this, having adopted a standard in one case for all plate, and the rest would be as easy as falling off a log. He further said that he knew of boilers now being made of two qualities of steel, the good quality being in the under half and the upper half being made of tank steel. The object of the association was to prevent this and to insure good workmanship and good material.

Mr. Hunsiker said that there was no difficulty whatever in getting steel to conform to the specifications adopted by the association, and that it was only a question of phosphorus and the amount to be paid for the steel.

#### State Inspection Laws.

The Committee on Uniformity in State Inspection Laws had no complete report to make, but the discussion following the presentation of the subject was interesting, and brought out many facts not known to all the members. Nebraska was the only State in which State inspection laws were enacted, and in which they were not a dead letter.

Mr. Dunden explained that the United States inspectors will receive no report as to the quality of a plate except their own. The inspector must stamp the plate and sample and make his own test according to his instruction, and he will receive the work of no one else as a voucher for this.

The opinion appeared to prevail that through Congress nothing could be done to further the object aimed at, and that it only remained to formulate such rules as would cover all cases and then petition the Legislatures of the several States. In this way the desired end might be reached.

#### Insurance.

During the several sessions of the convention the question of forming an insurance association, in which the association should be interested as a unit or by its individual members, continually cropped out. A report showing the condition of the two principal insurance companies, and of which we give later on a synopsis, was presented, and at the last session a set of resolutions were carried authorizing the appointment of a committee to execute the insurance scheme. The impression early got abroad that there was a great income to be derived from this source, and that all money invested would return 4 per cent. far in excess of that to be gained by following the boiler making business. One member stated that during last year he had turned out boilers to the value of over \$600,000, and that he had made on this amount of business 4 per cent. He was therefore in favor of any scheme in which he could place his money and receive a dividend of 70 per cent., as he understood would result from the formation of an insurance company. The statement of a 70 per cent. dividend seemed to take firm hold of the meeting, and at the last session when the question as to how much of the stock of the company should be

held by the association and how much should be permitted to go outside, it was stated on the floor by one member that if 49 per cent. was permitted to go outside he would immediately resign his membership in the association in order that he might take all of the outside stock. It now remains for the association as represented by the committee to formulate a business scheme, inaugurate the insurance company, and then make the 70 per cent. dividend which operated so powerfully during the last session. The report presented is briefly outlined as follows:

The report first generally outlined the subject and showed the advantages that would result from the successful operation of such a plan. It then gave the reports of prosperous insurance companies now doing business. The report of the Hartford Steam Boiler Inspection and Insurance Company for 1888 showed total assets of \$1,275,114.02; an aggregate income received during the year in cash, \$672,147.93, and aggregate expenditures in cash, \$528,423.03. The total premiums and inspections received from the organization of the company to date, \$4,839,912.72. Total losses paid from organization to date, \$351,680.10. Total cash dividends declared since the company commenced business, \$389,750. Total amount of losses incurred during the year, \$44,488.14. The Fidelity and Casualty Company's report for 1889 showed cash premiums received on steam boiler risks, \$68,701.31, while the amount paid for steam boiler losses was \$1070.47. During the year 1889 the cash income of the American Steam Boiler Insurance Company was \$563,195.21 and the cash expenditures, \$492,675.93.

The report dwelt upon the absolute necessity for obtaining reliable and thorough inspection. The report also contained a synopsis of the laws of the various States with reference to incorporating a company for insurance against loss of life or property by steam boiler explosions.

#### Officers.

The following officers were elected:  
*President.*—James Lappan, Pittsburgh.  
*Vice-Presidents.*—Phillip Rohan, St. Louis; John Mohr, Chicago; C. Cunningham, Brooklyn.  
*Secretary.*—A. T. Douthett, Allegheny.  
*Treasurer.*—R. Hammond, Buffalo.

#### VIRGINIA IRON NOTES.

At Allisoria the Toney Mining Company have been organized with a capital stock of \$3,000,000, and will develop the H. T. Clarke iron mines. R. M. Lawson, of Burk's Garden, is president; J. A. Walker, vice-president; M. M. Caldwell, secretary.

It is reported that the great bolt and nut manufacturers of Philadelphia, Hoopes & Townsend, are contemplating the removal of their plant to Radford.

On July 1 James Wylie and Alfred J. Thomas, under the name of the Salem Hardware Company, opened a general hardware business in the growing town of Salem.

At Glasgow negotiations are said to be pending for the location in that town of a foundry and machine shop, merchant bar mill, chain works, and an iron safe works.

Capitalists from Pittsburgh, are prospecting at Shendum with a view of establishing a railway supply works.

Steps are being taken at Clifton Forge looking to the establishment of a nail works.

E. H. Stewart, Henry Body and J. M. Gambill, of Roanoke, have optioned 6114 acres of mineral lands around Rocky Mount, at \$65,287.70.

At Richmond, the Marion Marble and Mineral Company has been incorporated with a maximum capital stock of \$100,000. W. Miles Carey, is president, and E. A. Palmer, is secretary.

The Thill Coupling Company, with \$10,000 capital stock, has been incorporated at Roanoke by J. O. Kinsey, L. L. Powell, G. Y. Booker, and others, to establish a plant for the manufacture of a patent car coupler.

The Gaston Mineral Company, with \$500,000 maximum capital stock, have been incorporated at Richmond to buy and sell mineral lands and manufacture iron and steel. T. M. R. Talcott, is president, and E. A. Palmer is secretary.

The Shenandoah Furnace Company, of Shenandoah, report business good with them. They are entirely sold up for delivery prior to September 1.

#### A Threatened Ore Blockade.

The Lake Superior ore shippers have issued the following circular to consumers of Lake Superior iron ore:

Your attention is earnestly requested to the crowded condition of the ore docks at Lake Erie ports in order that you may give us your active co-operation in remedying a state of affairs that is rapidly becoming serious. The entire storage capacity of those docks is less than 50 per cent. of the total tonnage brought down during any season of navigation; and as nearly 1,000,000 tons of last season's ore were left over on May 1, 1890, thus greatly encumbering the docks, they will soon be absolutely unable to receive a large proportion of the tonnage for the year 1890, which will exceed the actual product and sales of the year 1889. Probably never before in the history of the ore trade have purchasers of ore been less prompt in giving shipping orders and moving the ore forward. Up to the present time, not more than 25 per cent. of the tonnage already brought down has been forwarded, and if the present state of affairs continues for a short time longer, it will be impossible to unload vessels except directly into cars; prompt dispatch cannot be given, and the entire ore and carrying trade of the lakes will be seriously demoralized.

Many of us have already been notified by the dock companies, to which have been consigned large portions of ore purchased by you for delivery during the year, that our allotted spaces for several grades were entirely filled, and that no more ore could be received for our account, unless each cargo was accompanied by shipping orders on arrival. Vessels chartered by us are being generally delayed and unless immediate and adequate relief is given, heavy losses for demurrage will be incurred, and a large amount of tonnage sold for delivery this year cannot be transported to Lake Erie ports. Cars are now plenty, but shortly when the active movement of coal begins, they will be diverted for that service, rendering it impossible for us to promptly ship ore on your contracts at a rate to make up for time lost now, and you will then suffer for a lack of ore to an equal if not greater extent than the docks are now burdened with the excess of it.

In the present and threatened emergency, we can only look to you for relief, and we therefore earnestly request each consumer to immediately increase shipping orders to the fullest possible extent, in order that the legitimate and proper movement of ore may be accomplished, and that the impending demoralization of the trade for this year may be averted.

The circular is signed by Oglebay, Norton & Co., M. A. Hanna & Co., Dalliba, Corrigan & Co., Runyon, Stubbs & Mack, J. H. Outhwaite & Co., Pittsburgh and Lake Angeline Iron Company, Harvey H. Brown & Co., Pickands, Mather & Co., Cleveland Iron Mining Company, Iron Cliffs Company, Michigamme Company, Humboldt Iron Company, Republic Iron Company, E. C. Pope, Tod, Stambaugh & Co.

The city of Worcester, Mass., is trying an experiment in the way of disposing of her sewage that is decidedly interesting. In the river valley, below the city, works have been constructed at a cost of about \$50,000 for the purification of the sewage.

## THE WEEK.

The Chicago, Burlington and Quincy Railway Company has commenced building a branch line to Harney's Peak, S. D., a distance of several hundred miles, in order to reach the tin mines of that section.

A tunnel nearly a mile in length has been cut through Locust Mountain, at Ashland, Pa., by the Locust Mountain Coal and Iron Company, for the purpose of draining the Centralia coal basin and giving access to the Mammoth vein workings which have been filled with water several years. The tunnel is 7 feet high and 11 wide and is the most remarkable piece of engineering work undertaken in that part of the State.

A party of prominent railway men left Chicago over the Wisconsin Central, bound for Alaska, and a prophet says we expect to hear that Villard and others have arranged a railway scheme which may some day form part of an all rail line to Europe, via Siberia.

Wonderful stories are told of the richness of the copper mines in Idaho, particularly in Washington County. Large quantities of ore are being taken out, high up in the mountains, ready for transportation when railroads are built. A letter from Seven Devils, says Idaho stands third in the production of precious metals, and in three years will head the column with an output of \$50,000,000.

The New York importers of German looking glass plate have formed a company with \$500,000 capital to control the trade, and elected S. J. Bache, president.

The Pacific Navigation Company runs a fine line of steamers from Tacoma to Seattle, Fairhaven, Schome and other Puget Sound ports.

The Dominion revenue at Montreal shows a total from customs for the year ending June 30 of \$8,776,800, a decrease of \$488,500, compared with the previous year, but the inland revenue is larger.

The initial iron bridge for street crossings at the ferries has been completed at the corner of Rector and West streets by the Central Railroad Company, of New Jersey. Another for the Pennsylvania Railroad will follow at the foot of Cortlandt street.

Property in Pennsylvania taxable for county purposes increased last year nearly \$154,000,000. Money at interest increased \$17,000,000.

The Master Builders' Mechanical Trade Schools, of Philadelphia, have received a generous endowment from Col. T. H. Auchmuty, proprietor and originator of the New York Trade Schools, at First avenue and Sixty-seventh street. The endowment gives \$3000 annually until 1894, to be distributed equally among the various trades already founded in the schools. Mr. Auchmuty's idea is to supply from his own resources any amount needful to meet deficiencies until the trade schools in New York and Philadelphia are fully established.

The exterior street to be built on the East River front above Eighty-first will cost \$1,645,000. The enhanced value will much exceed this sum.

Companies whose nominal capital aggregate about \$120,000,000 have been incorporated in New Jersey since the beginning of the year. The last great concern was the gas trust, with \$50,000,000 capital and \$10,000 paid in. The State taxes these companies one-tenth of a mill on each dollar of authorized capital. The New York State tax is one-eighth of a mill.

That is the reason why the gas company is a New Jersey corporation instead of a New York, unless the company is also afraid of anti-trust legislation. The New Jersey corporation laws are much more liberal than those of most States in all respects.

The Vesuvius has demonstrated her qualities as a ram, having cut two 14-inch dock timbers clean in two at the Brooklyn Navy Yard, besides demolishing the granite dock. Strange to say, the plates of the Vesuvius adjoining the point of impact are in no way disturbed, save for a slight inequality in a spot about 6 inches square on the starboard bow.

Mayor Grant's rapid transit scheme is likely to rest until the autumn, when Wm. K. Vanderbilt, Chauncey M. Depew and others interested will consider the subject and perhaps devise a plan for co-operation.

Wyoming is suddenly raised from the ignoble position of a "cattle range," and Idaho from that of a "mining camp" to the dignity of States in the Federal Union. Idaho, the latest admitted, is the forty-fourth State.

The St. Louis local authorities have under consideration a plan for disposing of city garbage, known as the Merz crematory system, originally introduced in Vienna, and already in successful operation in Buffalo, Detroit, Milwaukee and other American cities. Two plants are proposed, one at each end of the city, and to cost \$150,000.

The English syndicate that recently bought the Union Stock Yards in Chicago for \$19,000,000, failed to secure a title to anything but the place where the business has been done. In this particular they are said to have been caught napping, since it is possible to transfer the business to another point. Already the Chicago packers, it is said, have secured valuable property at Lyons for a new site, and twelve of the principal railroad companies will co-operate in the enterprise.

The Chilean Government is proving a good customer to France. The Forges et Chantiers de la Méditerranée have under execution four war vessels for that Government and a great deal of valuable work has been placed with Creusot. The latest order is for 88 lanterns for lighthouses that are to be constructed off the coast of Chili.

The recent unsuccessful strike on the Illinois Central Railroad is followed by a circular letter from President Fish urging all employees to invest their savings in Illinois Central stock. He suggests that each one notify the company how much he wishes to invest each year and a certificate of stock will be issued for it, the amount to be deducted from the men's pay. This idea is to get the employees of the road to take a personal interest in its earnings.

The grand jury brought in a presentment relative to the frequent eruptions of steam and gas in the streets and suggested as a remedy the appointment of a commission of experts who shall consider the feasibility of vesting the management of street paving and of all underground pipes and sewers in one department.

France votes to impose a duty of 3 francs on maize or Indian corn. France took 6,564,952 bushels of our corn during the fiscal year 1889. A part of the French market for this we shall lose.

The commerce through the Sault Ste. Marie Canal, made up very largely of copper and iron ore, is increasing beyond precedent and in a very short time will compel the enlargement of the locks. A report for June says that 1752 vessels

passed through during the month with a registered tonnage of 1,377,800. The freight carried amounts to 1,413,000 tons, showing an excess over any previous year.

Philadelphians lament the dropping of their city to the third place in the census list, and bitterly denounce the malign railroad influence through which, as alleged, Chicago has prospered at their expense. The *Record* says its manufacturers have been driven to other cities where they could obtain the benefits of competitive rates. Its merchants have been denied those facilities for trade and communication with the outside world which were vitally essential to its progress. Public and private enterprise has been repressed. Public streets have been appropriated, &c. The latest project of connecting railroads with the water front by a belt line has been at least temporarily defeated.

The Director of the Mint, in his annual report on the production of gold and silver in the United States, shows that during the past year the stock of gold in the country declined \$15,786,000, whilst that of silver increased \$34,871,000. As this fact is contrary to the experience of the last 15 years the question arises whether the baser currency is not displacing the superior one, in accordance with natural law.

The way in which the Government awards mail contracts to the steamship lines is very interesting. Just now there is a vigorous and some say probably successful effort being made by the North German Lloyd ships to get the mail-carrying supremacy away from the Cunarders. The theory of the award is that it goes to the swiftest ship.

The American Ramie Company, incorporated five years ago, with a supposed capital of \$1,000,000, to manufacture fiber under what was known as Juvenet's patent, does not prove successful. The main difficulty appears to be in the chemical treatment of the fiber to remove the gum, which is said to weaken the resultant fabric. The company decide to liquidate.

The scientific results of the Government inquiry respecting the irrigation of large sections of the arid plains in the new States by means of artesian wells are proving to be valuable. Col. E. S. Mettleton, supervising engineer of the investigation, in a preliminary report says: The Dakota basin will furnish, from present indications, irrigation water for a large area at a cost per acre not exceeding that of some irrigation enterprises in the arid regions. The water in some of these wells can undoubtedly be used advantageously for the irrigation of common field crops. The artesian basins found in Nebraska, Kansas, Colorado, New Mexico and Texas are quite numerous, but their areas are small, and the flow from the wells is generally light compared with that of the Dakotas. While the irrigation of common field crops from small artesian wells may not be practicable, yet there are numerous instances where the wells are sufficiently large to afford quite a surplus of water above that required for domestic use.

The gigantic Beef Trust recently incorporated in Denver, with \$15,000,000 capital, is intended to consolidate in one company all the live stock and grazing corporations in Colorado, Wyoming, New Mexico and Texas, heretofore represented by the American Cattle Trust. It will be known as the Western Union Beef Company. The property involved comprises 600,000 acres, on which there are upward of 150,000 head of cattle. The estimated brand of the different companies for the present year is over 25,000, and the estimated beef output the coming fall about 25,000. The actual value of all this property is estimated at about \$5,000,000.



A portion of the stock will be issued for the purpose of exchanging it for the property of all the old companies, and a part reserved for the purchase of additional cattle and lands to enlarge the business.

## MANUFACTURING.

### Iron and Steel.

The Chester, Pa., Rolling Mill Company, at a recent meeting, voted to increase their capital stock from \$600,000 to \$1,000,000.

The Gracey-Woodward Iron Company have been organized to build an iron furnace and machine shop at Clarksville, Tenn.

Alice furnace, of the Tennessee Coal, Iron and Railroad Company, shut down July 1 for general repairs. The shutting down of the furnace was hastened by impending labor troubles, and it will probably remain idle for two months.

The employees of the North Alabama furnace, at Florence, Ala., are on a strike, and the furnace is shut down. The employees of the Sheffield furnaces have also struck, but the trouble in both cases is thought to be only temporary.

Ground has been broken at Cardiff, Tenn., for the first blast furnace.

The furnace of the Kirkland Iron Manufacturing Company, at Kirkland, N. Y., has been blown out, owing to dullness of trade and a large accumulation of stock.

The Cummings Iron Works, at Hammond, Ind., have been purchased by a syndicate, who, it is said, will increase the plant and employ 500 hands.

The Scranton Steel Company, of Scranton, Pa., made during the six months ending June 30, 1890, 101,441 gross tons of steel rails.

The Fort Payne, Ala., Coal and Iron Company have opened an office in Boston, at 16 State street, under the management of Vice-President H. B. Peirce.

The steam and water mills of the Burden Iron Company, of Troy, N. Y., have shut down for several weeks.

Work has begun on the draft stack of the new Philadelphia Furnace, at Florence, Ala. It is to be 190 feet high. The hull of one of the stoves has been finished, and the underground flues are being rapidly constructed.

No. 1 Furnace, at Fort Payne, Ala., is completed, with the exception of the blowing engines, and the furnace will soon go into blast.

The plant of the Lookout Rolling Mill, which is shortly to be removed from Chattanooga, Tenn., to New England City, Ga., will be considerably enlarged, and several extra trains of rolls, additional engines for driving them, more puddling and heating furnaces and a large machine shop will be added.

The Pennsylvania Tube Company, of Pittsburgh, have increased their capital stock from \$1,200,000 to \$1,600,000.

The Ironton Furnace Company, of Ironton, Ohio, are now operated by E. J. Bird & Co., the change dating from the 1st inst.

The Lebanon Iron Company, of Lebanon, Pa., of which Robert N. Coleman is president, A. Hess is secretary and treasurer, and Thomas Evans is superintendent, have just put in operation a 12-inch bar mill, built by the Lewis Foundry and Machine Company, of Pittsburgh. It is equipped with two Stubblebine gas heating furnaces, and is placed in a new addition of 100 x 300 feet.

### Machinery.

The Walker Mfg. Company, of Cleveland, have secured a permit to build a \$100,000 structure in their yards at Waverly avenue. The building will be of brick and iron and will measure 200 x 500 feet. It will be utilized for all branches of work, but will chiefly be devoted to the manufacture of cable appliances and machinery, a growing feature with this company.

The Hurlbut Mfg. Company, at Racine Junction, Wis., have found their capacity insufficient to supply the demand for their brass and gray iron castings and have decided to build a new foundry which will enable them to double their output.

The foundry of Ely & Ramsay, at Peekskill, N. Y., was recently damaged by fire, and many valuable patterns and much stock destroyed.

The International Boiler Company are reported as having under consideration the building of a plant at Pittsburgh or at New Castle. The boiler manufactured is that

known as the Stirling. Allan Stirling is president and treasurer, Robert P. Orr is secretary, while J. Townsend Burden, R. S. Cutting, John Jardine, R. C. Alexander and John T. Taylor are directors.

The Homestead Steel Works, of Carnegie, Phipps & Co., are to have one of the largest stationary engines in the country. It is of the Corliss pattern and will have a horizontal cylinder, 54 x 72 inches. The fly wheel will weigh 200,000 pounds. The engine will weigh a little over 500,000 pounds, and it is expected to develop 3500 horse-power.

It is probable that large boiler works will be erected at Carthage, Mo., in connection with the Carthage Foundry.

The American Ice Machine Company, of Fort Wayne, Ind., have been organized with a capital stock of \$1,000,000.

### Hardware.

The Washburn & Moen Mfg. Company, of Worcester, Mass., have purchased a 50-acre tract of land near Cummings, Ill., a suburb of Chicago. It is located on the Chicago and Western Indiana Belt Railroad, and forms a most eligible site for the branch establishment which the company will probably erect. Beyond the purchase of the land the plans of the company have not yet taken definite shape, and it is probable that action will be deferred until fall to await the return home of some of the company's absent directors. Enough is known of their intentions, however, to warrant the belief that the works to be erected will cover the manufacture of wire from the crude material, in order to compete on the most favorable terms possible with other establishments.

Chelsea File Works, Norwich, Conn., report an increased demand for their specialty—Chelsea hand cut horse rasps. These goods are described as made of the best crucible steel, specially prepared, hand cut and the teeth high and pointed, presenting a surface of unusual strength and cutting properties. The manufacturers endeavor to make a superior article, and refer to the care taken in the selection of stock, good workmanship and the rigid inspection of all work before leaving the shop, as important factors in the establishment of the excellent reputation this line of rasps bears. An increase of facilities is contemplated during the summer months.

Ludlow-Saylor Wire Company, St. Louis, Mo., are kept busily engaged in their art metal department. Among the contracts recently secured by them they report one for brass work at First National Bank, Mauch Chunk, Pa.; also a handsome partition railing 7 feet high and 50 feet long of solid brass work, to be placed in the Bower House of the People's Railway Company, St. Louis.

The tack factory at Racine, Wis., has been completed, the machinery is in place, stock has been secured, and by this time it is probably in active operation.

The Spur Wire Fence Company, of Lockport, Ill., are successors to the Larm Mfg. Company, who were burned out at Van Buren and Clinton streets, Chicago, in January last. The company were reorganized in February by the election of J. A. Barber, president; R. R. Street, secretary; William Boldenweck, treasurer, and Henry Heule, manager of the factory. The capacity of the works is about 10,000 pounds of fencing a day, while they possess facilities for increasing the output with the growth of trade. They are operated by water-power. Treasurer Boldenweck has his office in Room 728 Opera House Block, Chicago.

We are advised by the Stover Mfg. Company, Freeport, Ill., that trade has been exceptionally good with them, the demand for New Idea spring hinges still continuing notwithstanding the lateness of season. It is stated that the sales of this article more than double that of last season. Orders have also been booked for large quantities of their well-known Ideal sash pulleys. The company make a large line of builders' hardware and are constantly adding something new to it. Their energy and enterprise and the merit of their productions are referred to as contributing largely to the extension of their plant and business. An illustrated catalogue with prices will be mailed on application.

The Graphite Lubricating Company, of Jersey City, N. J., advise us that during the past year they have received a large number of orders from electric houses or electric roads for their bushings, which they have furnished in large quantities. The advantages claimed for these goods is that they require no grease or oil.

### Miscellaneous.

Rathbone, Sard & Co.'s large stove foundry at Aurora, Ill., made its first heat on June 25. It forms an important addition to the consumers of pig iron in Illinois.

The Carroll-Porter Boiler and Tank Company, of Pittsburgh, Pa., recently received an order for a large number of oil tank cars from South America. The competition in this case was very close, as the order was a very desirable one, but the superior facilities in the way of machinery and means of handling enabled this company to get the business. They also received not long ago the order for 300,000 barrels of tankage for the oil country.

West Superior, Wis., capitalists are considering the advisability of organizing a stock company for the manufacture of safes at that place. The company is said to have \$200,000 at their command.

The Phoenix Boiler and Sheet Iron Works will be removed from Kansas City, Mo., to Joplin, Mo.

The Schiller Wire Fence Company, of Washington, D. C., will locate at York, Pa. A plant will be erected at an outlay of \$125,000, and 200 hands will be employed in the works.

## Massachusetts Industries.

Horace G. Wadlin, Chief of the Bureau of Statistics, has issued the annual report of the Bureau of Statistics on manufactures. The returns give the following condensed general statements for the years 1888 and 1889, for 1364 establishments:

1. The decrease of capital devoted to production in 1889 as compared with 1888 amounted to 1.44 per cent. The increase in the value of goods made reached 2.45 per cent. In 1888 the average number of persons employed in all the establishments represented was 198,014, and the average number of persons employed in the same establishments in 1889 was 200,685; this is an increase of 0.89 per cent. in the average number employed. The number of persons employed at the periods of employment of the greatest number shows an increase of only 0.06 per cent. in 1889 as compared with 1888, while the number employed at periods of employment of the smallest number shows an increase of 3.82 per cent. The range of unemployment was greater in 1888 than in 1889, the number unemployed at some period, of longer or shorter duration, in the former year being 51,697, as against 45,352 in the latter year, a decrease in 1889 of 12.27 per cent. The average number of persons employed in each establishment during 1889 was 147; the average number employed during each month of the year, in each establishment, ranged from 145 persons to 148 persons.

3. The average yearly earnings per individual, without regard to sex or age, employed in the 47 industries were \$418.19 in 1888, and \$419.17 in 1889. The range from highest to lowest average yearly earnings was from \$872.14 to \$266.67 in 1888, and from \$744.74 to \$305.44 in 1889. The higher earnings ruled in the industries demanding greater skill and employing males chiefly, and the lower in factory industries employing a large proportion of females and young persons.

4. The average proportion of business done reached 77.52 per cent. in 1888 and 76.74 per cent. in 1889, of the full productive capacity of the 1364 establishments compared. In 1888, 917 establishments, and in 1889, 883 establishments ran practically the entire year.

The conditions outlined in this general statement are predicated upon data from the specified number of representative establishments making returns both in 1888 and in 1889, thereby permitting direct comparisons to be made for identical establishments upon the same basis for each year.

Another manual training school for the accommodation of 100 boys will be established by the Board of Education, President Sheppard having provided sufficient funds to purchase benches, vises and lathes, besides defraying other necessary expenses.

# The Iron Age

New York, Thursday, July 10, 1890.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, JR. - - EDITOR.  
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

## Changes in Business Methods.

A contemporary has taken considerable pains to compile an account of foreign capital invested in this country within a year or so, which, in view of its volume, tends greatly to alter former conditions; whether for better or worse depends greatly from what standpoint one looks at it. The aggregate amount is \$205,000,000, about one-third of which is in breweries. The remainder is distributed among the most profitable industries of the country.

Car Trust Investment Company.....	\$5,000,000
Chicago elevators.....	4,500,000
Dickins Custer Mines .....	2,100,000
Gatling Gun Company.....	4,000,000
Iron and Land Company, of Minnesota.....	5,000,000
Linotype Company.....	5,000,000
United States rolling stock.....	4,000,000
Five debenture corporations, to promote industrial enterprises.....	40,000,000
Two land and colonizing companies.....	20,000,000
Two mining companies.....	5,000,000
Otis Steel Company.....	4,500,000
Eastman's Pork Packing Company.....	3,000,000

The remainder is made up by various commercial undertakings. This movement at the present time is at its height, and in view of the possibilities of future operations of the same character, particularly in the large undeveloped resources of the South, so long as the capital holds out much more to the same end may soon see the light.

Most of these concerns are over capitalized, but as the foreign investor is satisfied with small dividends, the effect in this particular, other things being equal, will cause no perceptible diminution of the appetite for more. But it may be questioned whether the other conditions are equal; whether a new corporation can step into the groove of an established business and earn the same rates of profit. Appearances indicate that it cannot be done, and the great decline in the Allsop Brewery, in England, since its reorganization, lends weight to that view. In answer, it is claimed that the active management of the firm bought out is retained, which fact insures the same profits. It is doubtful, however, whether the old management has the same interest to make the new corporation a success which inspired its work before the change took place. The men who built up the business may be less inclined to work and develop fewer of those original features peculiar to a man when he is engaged solely in his own behalf. The knowledge that future profits are to be shared by strangers, certainly lends no stimulant to extra endeavor. The question is difficult. The majority of people will prefer to await results before passing judgment upon it.

While this plan is safe enough for the disinterested observer, there is another class who encourage no such delay. It may be noticed in the above tabulated summary that five corporations have recently organized for the purpose of promoting this particular business of reorganizing existing firms upon an enlarged capitalization, and that these five corporations collectively possess \$40,000,000 capital. It is a profitable employment to such promoters, for they share a division of the first allotment of shares, ostensibly for service rendered, yet the charge made is no trifling sum. But as it is in the shape of watered stock, which the public is invited to buy, the original firm which is being reorganized seems to feel that it does not come out of their pockets. These five corporations are as yet hardly underway, but they are rapidly reaching a stage when new enterprises may be offered for sale on the market at any time, and in a form tempting to the small investor of \$5 shares. Now these small investors, in the aggregate, have much larger sums at their command than all our national banks put together. Thus it may be surmised that a direct appeal to their desire to make a little profit on a small investment is highly calculated to yield large returns to the five mentioned promoters, or such of them who cater to that kind of business.

New reorganizations of the described kind cannot, in the ordinary nature of things, successfully compete against rival firms who carry no watered stock. Now, the question arises, does not the promotion of such reorganizations entail the development of a later active American competition that will finally sweep away overcapitalized efforts in the same field? Again, will there not be a tendency among the old managements who are retained to run the new over capitalized concerns, to again branch out for themselves, and allow the reorganization to take of itself, even from force of old habit, or from a dislike of a newly imposed interference with their old way of conducting their business.

There is much to be said upon this subject in view of the large capital employed, and the tendency it creates to alter established usages; particularly as all the large lines of business of the country may sooner or later be involved. But a distinction should be made between our methods of corporate management and foreign corporate overcapitalization. This distinction should be borne in mind by every one interested. Corporate management promises to absorb all of our prominent private firms in the near future, for the simple reasons that such firms would thus be released from responsibility beyond the capital employed, and the fact of the firm's ready adjustment to the death of a partner without serious loss to the business. The recent success of the H. B. Claffin Company which received 500 per cent. subscriptions to their offered stock of \$3,000,000, is attracting the attention of other firms who are reflecting upon its advantages.

Questions are gravely asked concerning the inaction of Congress with reference to the operation of the Interstate Commerce

law. It is conceded on all sides that the subject is much involved, full of perplexities, and yet one that deeply concerns the interests of the country. Most noticeable of all is the fact that while the intent of the law was to do away with unjust discrimination by railroads in the transportation of freight, one effect is to place the entire railway system of the country at a disadvantage in competing with Canadian railroads, on account of the restrictions thus imposed. At the same time the fact is observed that however detrimental the operation of the law in this respect, lake and river transportation has prospered as never before. For the same reason large sections of country less favored with facilities for navigation are severely handicapped, and the anticipated benefits to accrue from investments of capital within the prescribed limits are not realized. These various circumstances and conditions challenge careful inquiry, in order that the costly experience thus far acquired, and which has been studiously observed by duly authorized commissioners, may be turned to some practical account. If the law cannot be modified to meet the exigencies of the situation without in effect nullifying the whole thing, then a question might arise respecting the wisdom of removing the law from the statute book. In any case, there is no time to be lost.

## Uniform Freight Classification.

Our readers will be pleased to learn that at last there is some prospect of the adoption of a uniform classification of freight by the railroad companies traversing the greater part of the country. It has long been an annoyance to shippers that when they desired to reach distant points they encountered obstacles in the way of freight classifications which were almost an unsolvable problem. The Interstate Commerce act performed a good service in compelling railroad companies to publish their rates and to make them uniform to all their patrons, but it should have gone a step farther and provided for a uniform classification of freight. The business of this country depends so materially on the railroads that a matter of this kind is of deep moment. It is urged by some railroad companies that a uniform classification operates to the disadvantage of manufacturers along their line, who would be subjected to more severe competition from distant manufacturers thus enabled to make direct shipments. The manufacturers, however, take a different view of the matter.

As we have already pointed out, there are some sections of the West in which the growth of manufacturing interests is impeded by the action of the railroad companies. They do not hesitate to change the classification on a commodity from a very high to a very low one as soon as they see their traffic threatened in a certain line by the establishment of local factories. This freedom of action is probably what the railroad companies wish to retain, who now object to the adoption of a uniform



classification. They would then be unable to make a quick change of front.

The hardware trade of the West is deeply interested in this matter, as hardware is billed from the East to certain cities as third class, while west of them it enters second class. Again, some Western distributing points find themselves discriminated against throughout contiguous territory by the lower classification given by the railroad companies to hardware received at a competing point. The discrimination thus made may not be intentional, but it is annoying and injurious to the jobbers of the section thus handicapped in the severe fight for a commercial foothold.

The adoption of a uniform classification would work injustice to no one, but would give all a chance on even terms. The new classification is to be submitted to the different railroad companies in August for their approval or rejection. As it has been prepared by a committee appointed by themselves for that purpose, the presumption is that no serious impediment will be encountered, but that the new universal classification will be in effect by the close of the year, if not before that time.

#### Pay Demanded for Striking.

It has remained for some strikers on the Illinois Central Railroad, at Chicago, to make a marked advance on anything previously aimed at in that line. They were beaten after they had suspended the operations of the entire Illinois Central system for four days and a half. Now they demand to be paid for the time they lost. Audacity might go further than this, but it would take a most ingenious brain to devise how. The demand almost paralyzed the officials of the railroad company when they fully realized what it meant. Even at the risk of another costly suspension of operations they were obliged to refuse it peremptorily. It was a bold stroke on the part of the men, however, which indicates the policy of the labor leaders generally. The step was hardly taken without consultation and advice, and while it was not expected that it would succeed, the effects were carefully observed. The Illinois Central can refuse such a demand and risk being tied up without regard to financial conditions, but are there not numerous corporations who would be almost compelled to accept such terms if they were imposed by workmen after a protracted and costly struggle? A second strike would probably mean financial ruin, and that nobody courts. Should such a policy be forced to any extent, however, it would speedily end strikes. Workmen would then have everything in their own hands. Employers would not only lose by the suspension of operations during the strike, but would bear all the expenses of the conflict. It is probably a mere dream of the enthusiastic labor agitator, which will never materialize into an accepted fact; but for all that it is an interesting development of the times.

#### The Growth of Cities.

Although it is an observation made by every intelligent person, and although it has been frequently commented upon, the tendency of the people to prefer city life is likely to be a fruitful source of discussion at an early date. One of the first deductions made from the statistics of population, now attracting so much attention, is sure to relate to the growing percentage of our population which dwells in the cities. Twenty-five towns, whose population is thus far reported, with 100,000 inhabitants and upward, show a total of 9,493,451 souls, against 6,435,447 souls in 1880. This is an increase of over 3,000,000, or 47 per cent., while the population of the whole country has grown by 28.6 per cent. If we were in possession of the figures for all towns above 10,000 inhabitants, the proportion would prove more startling still. It is well known, however, that in certain sections of the country the rural population has actually lessened in numbers, while in a good many other sections it has barely held its own.

It is probable that the next few months will bring many writers to the fore who deplore keenly that the temptations of city life draw from the country thousands only to be alienated from habits of thrift and earnest, honest work. It has become habitual with many to laud the virtues of village life. The vices of the towns are pictured in the blackest colors, and the degenerating tendencies are alluded to as constituting a serious threat to the community. There is cause for apprehension, undoubtedly. Many a career is wrecked, and a good deal of misery grows out of the inability to resist temptation, and failure to gain a position of advantage in the struggle for existence. But we feel convinced that the stimulus of new ideas, the effect of greater surroundings, the impulse of more serious effort, more than outweigh, through the success they beget, the losses due to failure.

The question is one which manufacturers generally have occasion to seriously study. On the whole, the tendency has been toward the selection of suburban sites, which combine, with cheaper lands, the advantages of adequate transportation facilities and greater accessibility to market. To some extent they avoid the migrating habits of city workmen, while offering the advantages of cheap rents and a resident corps of men.

The Duluth creditors of the Minnesota Iron Car Company accepted a plan of reorganization on the 1st inst., and relations with the New York company will be definitely adjusted, so it is said, within two months. The Duluth *Herald* says: "The New York company, in fact both companies, will be backed by the Post Martin Company, Boody, McClelland & Co., Brown Bros. & Co., Vermilyea and C. N. Jordan, of New York. Mr. Martin will be elected president and Mr. Jordan will take the position of general manager. Mr. Lee Ettenger will probably remain as general manager of the works. The Minnesota Car Company, as reorganized, will have a cash sum of not less than \$300,000 as a

working fund. The New York Iron Car Company have a nominal capital of \$2,500,000. About \$600,000 new cash capital will be put into this concern by the reorganizing syndicate."

#### Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., July 8, 1890.

It was proposed by Senator Morrill and his Tariff associates to renew their attempt to-day to take up the Tariff bill notwithstanding their set-back yesterday, but after consultation with the leaders of the senatorial majority this morning it was determined to yield to the silver promoters, they having reached an agreement with the House managers upon a compromise measure. Chairman Morrill was perceptibly exercised over the course of certain Republicans in voting with the Democrats against taking up the Tariff bill. The total vote, yeas, 20; nays 23, represented exactly a quorum of the Senate.

Two Democrats united with the Republicans in the effort of yesterday to bring the bill before the Senate. It will be seen that less than one-half the Republicans were in their places when this important movement was made by the managers of the tariff, and that six of the silver Republicans turned the margin of difference in favor of their pet scheme. There is no apparent doubt of the adoption of the conference report on the silver disagreements by the two Houses. Senator Morrill is, therefore, less disposed to antagonize the measure, as he sees that such a course will lead to expedition in the matter of consideration, by the elimination of one of the great questions before the two Houses, which might at any time obstruct the tariff.

The next parliamentary problem to be solved will be the question of precedence as between the Tariff and the Federal Election bills. This will undoubtedly be a matter of caucus consideration, in order to secure concert of action among the Republicans. The Democrats have already indicated their position. They will favor the consideration of the Tariff bill in advance of the Federal Election bill. There are some Republicans who are opposed to the latter measure, and will therefore favor giving the right of way to the tariff. If they should succeed with the aid of the Democratic senators, the House bill, with the Senate amendments, may be expected to occupy the attention of the Senate for a protracted season of debate. This programme, on the part of the minority, will have a two-fold purpose, the ostensible object being the presentation of the tariff policy of the Democratic party with reference to its effect upon the Congressional contests which will engage the attention and enlist the suffrages of the voters in the 330 districts which now comprise the representation in the constituent assembly of the people, and really for the purpose of delaying as late as possible the consideration of the Election bill. This measure the Democrats are determined to fight to the bitter end, or at all events until after the November election. If the Republicans should decide not to go on with the Election bill the end of the tariff debate will be easily reached, as the Democratic leaders, like Carlisle, Harris and Gorman, will then content themselves with a clear and concise statement of the position of their party for political rather than parliamentary effect.

In regard to the action of the Senate on the Tariff bill there will therefore exist much uncertainty until the senators show their hands in caucus. There is still a determination to act upon this bill. So

much has been expected on that point that to adjourn, without action by postponement until December, would be a disappointment which would cost the Republicans their main stimulus to an aggressive and reasonably encouraging winning campaign. The next week, in a preliminary way in tariff matters, in the Senate will therefore be important and interesting.

### EASTERN MISCELLANY.

The Caldwell bit brace factory, at Winchendon, Mass., will soon be in operation again. Goodspeed, Parker & Mason have formed a company to continue the manufacture of bit braces, hammers, &c.

Raising mill chimneys at Fall River, Mass., is quite the rage just now. The soft coal the mills are now using necessitates the chimney being increased in height to carry away the smoke which would otherwise blacken the building all around.

The Morse Twist Drill and Machine Company, of New Bedford, Mass., will erect a brick building, 164 x 35 feet, two or three stories high, and an ell 70 x 40 feet, one story high, on its premises. The main building will be 30 feet high, and the ell 18 feet, and will be used as a machine and blacksmith shop.

Work in the axe works at East Douglas, Mass., has been rather dull for the past few months, but indications are now that it will be much better, as a large amount of stock has arrived consisting of iron, steel and grindstones. The Axe Company have recently erected a new building 40 x 31 feet.

George H. Day has resigned the presidency of the Weed Sewing Machine Company, of Hartford, Conn., and Col. A. A. Pope, who has recently become the owner of the whole company, takes that office. Colonel Pope takes the presidency at the request of Mr. Day, and the latter gentleman will continue his executive work for the company, holding the offices of vice-president and treasurer.

The Warwick Cycle Company, of Springfield, Mass., have for some time been desirous of securing a site nearer the business center of the city, and a committee has been appointed to secure such a site, on which it is proposed to erect a new factory, specially equipped for bicycle manufacture. Two offers are now under consideration, and it is expected that a definite bargain will be made within a short time, so that work on the factory may begin early in the fall.

The Upson Nut Company's plant, rebuilt on the site of the recently burned works at Unionville, Conn., is nearly ready for operations. A large part of the machinery is in position. The company will use crude petroleum in their forges in place of coal when the works are started up. The system, as used in the Cleveland, Ohio, works, of the company is being investigated by one of the foremen of the Unionville plant.

The iron trade of Manchester, N. H., is an important one. All of the iron works have had a prosperous year. The corporation iron industries have been largely employed in meeting the demands of the mills here, but some outside orders have been filled. A prominent iron manufacturer of that city states that it costs so much to bring coal and iron from the mines to Manchester that it will be impossible to build engines and machinery for the West and South and make a living profit, unless the railroad rates be reduced to a very low figure—a cut which would be greater than the railroads could afford without serious loss. Western iron works are sending their manufactures East and underselling in the poorer classes of portable engines. Some Eastern works, which formerly built a large number of engines, have closed, as in Lawrence and Laconia, or have taken up other lines of effort, as in Nashua; they cannot compete with the West, which, though making an inferior class, puts them on the market cheaply.

The great growth of incandescent electric lighting is clearly shown by the remarkable business being done by the Perkins Electric Lamp Company, of Manchester, Conn. Until April 1, 1889, the "Perkins" Incandescent Lamp had been used exclusively by the Mather Electric Company in connection with their well-known system of incandescent lighting, but at that time the demand for the lamp for use on other systems of lighting had become so great that it was thought best to form a new company for the sole purpose of manufacturing and selling the lamp. The Perkins Electric Company started business on April 1, 1889, manufacturing then 500 lamps a day. Orders came at such a rate, however, that they were at once obliged to increase their production, and on July 1 they began turning out 1250 a day; but

even this increase was not enough to keep up with the demand for the lamp, and on October 1 their capacity was increased to 2500 a day, and again this spring it was found necessary to increase a third time, and they are now turning out lamps at the rate of 5000 a day, and having during the last few months been obliged to ask the indulgence of their numerous customers, as they have been from two to four weeks behind in their orders most of the time.

Within the next year and a half South Boston will, in all probability, lose one of its most important industries. By the end of that period the extensive plant of the South Boston Iron Works will be practically all transferred to the new location in the South, at Middlesboro, Ky., if present intentions are followed out. The removal will be gradual and Eastern orders will be taken up to the "11th hour," and arrangements for retaining New England customers in the new plant will be such that orders will be filled with great despatch and shipped at as reasonable rates as in the South Boston plant. Under these circumstances the company does not expect to lose much of its Eastern trade, while facilities for reaching the South and West will not be cramped as at present by double freight payments and competition of other iron works located near the iron and coal supplies of the West. The movement is not a sudden one. The company has contended for a long time against the heavy competition of Western plants, which, according to one of the officials, have been able to take work from under their very hands at rates considerably less than could be offered by a Boston concern. The South Boston Works would have probably remained many years more at its present location if it had not been for the generous offer of the Middlesboro syndicate—an offer that was in every respect, so the company considers, the wisest policy to accept. The company is largely engaged in the manufacture of heavy ordnance, and for this reason a nearer location to Washington was desirable. The cost of coal and iron will be reduced all of \$5 per ton by the change. Fine coal, which is used largely and now costs the company over \$3 per ton to deliver by boat and cart to the yard where it is banked up, will be given to them in their new location for nothing, and this item, although a small one, when combined with the other advantages, makes too favorable a showing in the aggregate to be resisted. The new plant at Middlesboro will be one of the finest in the country, and probably the best planned and equipped of any similar establishment. About 25 acres have been furnished, and the entire works will be concentrated under one roof. The building will be 1400 x 150 feet, and the interior arrangement will be in accordance with the most improved plans of iron mill architecture. There will be three large cupolas erected and two hot air furnaces—one of 15 tons and the other of 25 tons capacity. Electricity will be used largely in the transfer of power to the different machines and apparatus for handling coal and iron. Four dynamos will be put in, two for lighting of 700 lights each, and two for generating power. Immense traveling cranes will run the whole length of the building, so that the work can be handled with quickness and transferred to any part of the establishment.

The South Boston Works have a capacity for employing about 1000 men, but not quite half that number are working at present. Those now in the company will eventually be taken to Middlesboro, but in small numbers at first. The new plant, when running full, will employ 2000, but it will be several years before that number is reached. A large amount of work that is now done by hand will be dispensed with, as electric power will take its place. It is expected that more Government work will be obtained by the change. Work of this character at present is confined to the making of pneumatic gun carriages, gun mechanism, turret machinery and steering gear for two of the monitors now building, and a pneumatic disappearing gun carriage for the War Department. Steel guns are also being made to some extent, and it is the desire of the company to erect a steel plant, but there is no encouragement for such an addition under present condition and location of the plant at South Boston. It is proposed to put up a large steel plant at Middlesboro in addition to the main works, but it will be some time before it materializes. Preparations are being made carefully and slowly. As yet only the rough plans have been made out, and these will be subject to changes for some time, as improvements are being constantly suggested and observations made in the modern plants. It will probably be several months before ground is broken for a foundation, and the change will be made very gradually in order not to disturb the general business, probably taking almost two whole years from the time the foundations are begun before the South Boston plant is entirely deserted.

### The Oregon Iron and Steel Works.

We have received from C. N. Parker, of St. Paul, a description of the blast furnace at Oswego, Ore., which was recently visited by him. Mr. Parker states that the present daily capacity of this plant is 50 tons of pig iron and 25 tons of pipe and special castings. The description, which is in part taken from the *West Shore Illustrated*, is as follows:

The plant of the Oregon Iron and Steel Company, at Oswego, Ore., a few miles above the city of Portland, consists of a charcoal blast furnace and the only pipe foundry west of St. Louis. The enterprise was founded by the Oregon Iron Company, who built a blast furnace and made the first pig iron west of the Rocky Mountains, August 24, 1867. In 1878 the Oswego Iron Company bought the property, and in 1882 they sold out to the present owners, who have entirely reconstructed the plant, rebuilding and blowing in the furnace in 1888. The blast furnace has a 13-foot bosh and is 60 feet high, with six 5½-inch tuyeres. The bosh walls are protected by water blocks, and the column of the furnace is lined with fire brick 2 feet in thickness, with a back wall of red brick 18 inches thick. The down corner gas flue, from the furnace to the stoves and boilers, is of wrought iron, 6½ feet in diameter, lined with fire brick. For heating the blast there are three stoves of fire brick, with wrought iron shells, 15 feet in diameter and 75 feet high, with conical tops. The blowing engine is of the Weimer type, having a total weight of 100 tons and a capacity of 800 horse-power. The capacity of the blow is 12,000 cubic feet of air per minute, with 10 pounds pressure to the square inch. The power for running the engine is furnished by two batteries of French type boilers. No fuel is used either in generating steam or in heating the stoves, this service being performed entirely by waste gas from the furnace. The smoke stack is of wrought iron, 9½ feet in diameter and 160 feet high, and is lined with 9 inches of fire brick from bottom to top. The elevator has two cages capable of lifting 5000 pounds. The stock house is 60 x 180 feet, with two ore bins, or bunkers, with a storage capacity of 3000 tons each. The lime house, in one end of this building, holds 3000 tons of lime rock.

The mine of the company is about 2½ miles west of Oswego, and is connected with the works by a narrow gauge railroad. It is a fissure vein of brown hematite, averaging 10 feet in thickness, the ore yielding 40 per cent. metallic iron. The charcoal kilns are 36 in number, located near the furnace. They are of the beehive pattern, 30 feet in diameter and 13 feet high, each with a capacity of 50 cords of wood, which makes 2500 bushels of coal, and they can be turned twice a month. The railroad track runs along above the kilns, which are charged from the top. The coal from 100 cords of wood is required to run the furnace one day to its total capacity of 50 tons. A cable road takes the coal from the kilns to the furnace. The company's pipe foundry has a main building 68 x 180 feet, supplied with one 10-ton steam crane and three 5-ton hand cranes. It has a large pit for casting pipes vertically, and a capacity for turning out 25 tons daily, pig iron being taken from the furnace and remelted for this work.

The above is only a very brief mention of the principal features of the plant of the Oregon Iron and Steel Company. There are engine houses, pattern houses, a machine shop and sundry other adjuncts of a first-class iron manufacturing establishment, everything on modern plans. There is an admirable arrangement by which a supply of 2,500,000 gallons of



water daily is secured, with a head of 60 feet above the hearth. The shipping facilities are both by rail and water. The officers of the company are: President, S. G. Reed; vice-president, Wm. M. Ladd; secretary, Martin Winch; general superintendent, F. C. Smith; furnace engineer, E. C. Darley; engineer pipe foundry, Franklin J. Fuller; superintendent of the mines, James H. Pomeroy. The company own 2000 acres of mineral land and 14,000 acres of timber land in one body. They also have 10,600 acres of timber land in Washington Territory, and a mine of magnetic iron ore in British Columbia.

## NEW PUBLICATIONS.

**DERIVATION OF PRACTICAL ELECTRICAL UNITS.** 12 Illustrations; pp. 56. By Lieut. F. B. Badt and Prof. H. S. Carhart. First Edition. Electrical Publishing Company, Chicago, Ill. 75 cents.

The *Western Electrician* first published the biographies of eminent physicists, whose names and services to science have been perpetuated by being applied to the electrical units, and have thus become imperishably identified with the progress of electro-dynamics. The origin of these units is clearly stated in an introduction, briefly explaining the Centimeter-Gramme-Second system, known as employing the C. G. S., or absolute units. Practical units, which are multiples of these absolute units, have been more recently adopted for practical measurements, and their designation by the names of the prominent scientists who had worked to build up the system naturally followed. These biographies give information, not elsewhere easily found, of the special discoveries by each of these noteworthy men that led to the use of his name.

A table shows the quantities to be measured, their present and obsolete names, and their comparative values. It indicates Strength of Pole, designed by Weber; Intensity of Magnetic Field, by Gauss; Current (strength, intensity, rate, &c.), by Ampere; Quantity, by Coulomb; Electromotive Force and Difference of Potential (pressure, tension), by Volt; Resistance, by Ohm; Capacity, by Farad(ay); Power, Activity, by Watt; Work, Heat, Energy, by Joule.

It has required much knowledge of the wide field of electrical experimentation and progress to discriminate so well, as do these brief sketches, as to the merit of the respective claims of these scientists to the prophecies they made of great inventions or their discoveries. The portraits of this book, though coarsely made, are in some measure helpful to the memory of what these modest men have accomplished for the world, to whose honor and regard they generally came late in their lives.

The individual merits among scientists of these men may be thus indicated:

Weber introduced the system of absolute units, and established the truth of Ampere's principles. Ampere demonstrated for the first time the practicability of an electro magnetic telegraph, and by the discovery of the action of one electric current on another, established the elementary laws of electro dynamic action. His theory of molecular currents, explaining the connection between electricity and magnetism, which previous investigators had vainly sought to understand, was the most brilliant and complete discovery next to Faraday's laws of induction which has been made in this science. He anticipated the invention of the electric telegraph by suggesting in 1821 an apparatus having a separate wire for each letter. Coulomb invented the torsion balance, and proved that electricity, like gravity, varied in an inverse ratio of the square of the distances. Volta contrived the electrophony and the electric pile, and showed

that galvanism and electricity were identical. Ohm discovered the fixed laws of the electric current, and changed completely the method of measuring electric quantities, so that the strength of current and resistance could be accurately defined. Faraday, beside developing the induction of electrical currents and the evolution of electricity from magnetism, announced the great law of chemical equivalents. Watt developed nearly all the features of the modern steam engine. He invented the throttle valve, centrifugal governor, and the indicator, which draws a diagram of the relation of the steam pressure to its volume as the stroke proceeds, the instrument most important in perfecting the steam engine. Joule instituted the unit quantity of electricity, and laid the foundation of thermo dynamics in his "Joule's Law," and his discovery of the mechanical equivalent of heat. Werner Von Siemens achieved distinction in submarine and subterranean electrical inventions and in dynamo electric machines, and Sir William Sieman's in electro thermics. John Frederick Daniell will ever be known for his sulphate of copper batteries and the Daniell cell, still used as a standard of electromotive force. M. Hermann Von Jacobi declared the fundamental principles of electro motors, and made the discovery that the earth could be used as a "return" in a circuit for the telegraph.

Prof. H. S. Carhart has added to these sketches a short paper on the modifications of practical units to relieve the perplexity of workers in the electrical field in trying to attain to the precision of modern methods of calculation.

**WHITNEY & STEPHENSON'S BLUE BOOK, 1890.** Pittsburgh, Pa. 16 mo., pp. 157.

This is a complete financial and corporation directory of Pittsburgh and Allegheny and vicinity, with summaries of capital stock and assets, generally authorized by the officers of the business institutions whose reports have been quoted. It is a very neat and comprehensive handbook, the publication of a long known firm of brokers connected with the New York and Pittsburgh Stock Exchanges for many years. One may find here the statements of 76 banks, 20 insurance companies, 29 natural gas companies and 1150 corporations, with the addresses also of 68 stock and bond brokers.

**REFLECTIONS ON THE MOTIVE POWER OF HEAT AND ON MACHINES FITTED TO DEVELOP THAT POWER.** From the original French of N. L. S. Carnot. Edited by R. H. Thurston, M.A., LL.D., Dr. Engineering. New York: John Wiley & Sons, 1890. pp. 200. \$2.

This volume is dedicated to Sadi Carnot, President of the French Republic, in honor of himself, and of "an earlier Sadi Carnot, now immortal in the annals of science." It is of this Carnot that these pages speak, in the words of the publisher "as a relic, a memorial, a corner stone." The editor in undertaking to give the first English translation of his remarkable treatise says: "It is the work of a genius hitherto only known to a few men of science, whose inspiration anticipated many of the principles that those founders of the modern science, Rankine and Clausius, worked out through the tedious and difficult methods of the higher mathematics, and which were hailed by their contemporaries as marvellous discoveries."

Two essays precede the philosophical treatise, which constitutes the main portion of this book. They are both of special value to one interested in science. The first by Professor Thomson, the editor, admirably reviews the work of Carnot in its relation to the science of heat energy, of which he was the first exponent.

In the second, Carnot's brother, Henri Carnot, has sketched the incidents of his life and the personal qualities of this original thinker in physical science, with a discriminating but tender affection. Carnot published the little book, which has immortalized his name among scientists, in 1824, at the age of 24. He died at 36. His career was that of a genius. Its light was not recognized at once. The book attracted little notice till Clapeyron seized upon and illustrated its ideas by the use of the Watt diagram of energy. Sir William Thomson, when still a youth, discovered it, readjusted its principles to modern views of the nature of heat energy, "and gave it the place," in the words of the editor, "that it is so well entitled to in the list of the era-making books of the age."

The original paper being republished a few years ago, it became accessible to the public, and with other unpublished materials containing the essential principles of Thermo Dynamics, revealed the true founder of this science to the world. The original manuscript is now carefully treasured in the archives of the French Academy of Sciences. Carnot's ideas of "cyclo" and "reversibility," the two grand things he originated, gave the modern theory of energy its present enormous development, through the investigations and computations of Clausius, Mayer, Colding, Joule and other successors. His writings show a perception of the same ideas which Mayer and Joule exploited, in the line of whose valuable researches he seems to have contemplated for himself the pursuit of his great theme, from which his early death removed him. The now accepted theory of the nature of heat energy, that it is a mode of motion, appears in his unpublished notes privately holding it; though with regard to the authority of living physicist she based his work on the other theory that it is an imponderable substance, without impairing its efficiency to elucidate the present one. Carnot was a discoverer of the equivalents of the units of heat, which, by other processes of Mayer and Joule, were verified in their conclusions.

Carnot was the first to declare that the quantity of work done by heat is determined by the range of temperature in the operation. He announces with wonderful prescience that motive power is invariable in nature; that it is never produced nor destroyed, but changes in form. And again, he declares wherever there exists a difference of temperature there is a production of motive force. The difference between specific heat under constant pressure and the specific heat under constant volume is the same for all gases.

Carnot clearly states for the first time the thermo dynamic principle of the steam engine, and enunciates the essential principles of heat engines—that, 1, the temperature of the working fluid must be raised to the highest degree possible in order to secure a commensurate range of temperature; 2, the cooling must be carried to the lowest point in the scale that may be found practicable, and 3, the passage of the fluid from the upper to the lower limit of temperature must be produced by expansion or its spontaneous rarefaction.

With such introductory thoughts as these deduced from his editors, to the comprehensive work of Carnot, scientific readers will follow with deep interest the original paper and the thesis upon it by Sir William Thomson, which constitute the body of this book.

The ordnance outfit of the new cruiser Philadelphia will be placed in the ship at the Cramps', in Philadelphia. After receiving this armament the Philadelphia will proceed to New York, where the fitting out will be completed.

# TRADE REPORT.

## Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, July 9, 1890.

(By Telegraph.)

Midsummer weather, vacations and stoppages for repairs are all having their effect on the Iron trade, causing more or less quietness along the line. Considering all things, however, the condition of business is fairly satisfactory, and the autumn season is regarded with much confidence, especially by those handling finished products.

**Pig Iron.**—The week opened with heavy buyers in the market, who placed large orders for both Coke and Charcoal Irons. The intervention of the national holiday made the week a short one, but it was nevertheless very satisfactory from a business point of view. At present there are few deals pending, and it is altogether likely that trade will be quiet for a time. Dealers insist that prices of Coke Iron have been held closely to quotations, both for Northern and Southern brands; while Lake Superior Charcoal can no longer be bought at the prices current last week. Ohio softeners are in scanty supply, and held at slightly higher prices. The situation is undoubtedly very cheerful at the moment, and would warrant producers in taking a very rosy view of the future if it were not for the large increase to be made in production by the new furnaces now building in many sections of the country. Our consumption of Pig Iron will have to increase considerably beyond its present volume to absorb that output. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal.....	\$20.00 @	\$20.50
Local Coke Foundry, No. 1.....	16.50 @	17.00
Local Coke Foundry, No. 2.....	16.00 @	16.50
Local Coke Foundry, No. 3.....	15.50 @	16.00
Bay View Scotch.....	16.50 @	17.00
Am. Scotch (Strong Soft), No. 1...	19.75 @	20.50
Jackson County, Soft and Silvery, No. 1.....	18.00 @	18.50
Southern Coke, No. 1.....	16.50 @	17.00
Southern Coke, No. 2.....	16.00 @	16.50
Southern Coke, No. 3.....	15.50 @	16.00
Southern, No. 1, Soft.....	16.00 @	16.50
Southern, No. 2, Soft.....	15.00 @	15.50
Southern Gray Forge.....	15.00 @	15.50
Southern Mottled.....	14.00 @	14.50
Tennessee Charcoal, No. 1.....	19.00 @	19.50
Missouri Charcoal, No. 1.....	18.50 @	19.00
Alabama Car Wheel.....	22.50 @	24.00

**Bar Iron.**—The Bar Iron trade continues active, as the season is now at hand for making yearly contracts with agricultural works, and other consumers also seem to be free purchasers. Sales have been made by manufacturers' agents at 1.85¢, half extras, Chicago. But in a few instances this rate has been shaded for what were considered desirable orders. None of the regular sellers in the market will now name below 1.80¢, and most of them ask from 1.83¢ @ 1.85¢. Jobbers have lately been obliged to pay the outside rate quoted. The Youngstown price is 1.70¢ at mill, with makers rather indifferent with regard to new business. Stores ask 1.95¢ @ 2.10¢, full extras, according to quantity and quality.

**Structural Iron.**—Structural Iron is in heavy demand from bridge builders, who seem to be securing a great deal of work. Western railroads are not only renewing bridges along their lines, but are also building new structures at points where they have long been needed for convenience. The manufacturers of beams are meeting with a very heavy demand for them, and just at present the works are overrun with orders. The following quotations prevail on carload lots, f.o.b. Angles, 2.30¢; Tees, 2.65¢; Beams, 3.20¢; Universal Plates, 2.45¢ @ 2.55¢; Car Truck Channels, 2.40¢ @ 2.50¢. Beams sell from store in small lots at 3.70¢, but Angles and Tees at 10¢ @ 15¢ @ 100 above carload prices.

**Plates, Tubes, &c.**—The Plate trade has been extremely active in a small way. Local dealers are kept very busy supplying the demand from boiler and tank makers, and have had some trouble in keeping up their stock. The mills are advancing prices and their firmness is being reflected here. Tubes are very strong, although slightly less active than last week. Nos. 10 to 14 Iron Sheets, 2.80¢ @ 2.90¢; do., Steel, 3¢ @ 3.10¢; Tank Iron, 2.65¢ @ 2.75¢; Steel, 2.85¢ @ 2.95¢; Shell Steel, 3.25¢; Flange Steel, 3.50¢; Fire Box Steel, 4.50¢; Rivets, 4¢ @ 4.25¢; Norway Rivets, 40% off; Tubes, one three-quarter and less, 40% off; two to four and a half, 50% off; larger, 52½% off.

**Merchant Steel.**—In Merchant Steel the hot weather has cut off trade quite sharply, although a few houses report a fair trade in Tool Steel and other specialties. Large consumers are slow about placing their contracts, presumably waiting until they receive bids from every concern capable of handling such business. Tire Steel is now quoted at 2.40¢ @ 2.50¢ rates; Open Hearth Spring and Machinery, 2.50¢ @ 2.75¢; Bessemer Machinery, 2.25¢ @ 2.30¢; Crucible, 3.50¢; Tool Steel, 7¢ and upward; Crucible Sheets, 7¢, 8¢ and 10¢.

**Sheet Iron.**—Sheet Iron is quiet among manufacturers' agents, who report their mills well supplied with orders for the next 60 days. The usual quotation is 3¢ at mill for No. 27. A very heavy fall trade is expected. Jobbers quote small lots from store, 3.30¢ @ 3.40¢; Galvanized is still quoted by jobbers at 65 off for Juniata, although manufacturers are enjoying a heavy trade and insist that prices must be advanced.

**Steel Rails.**—A very large tonnage has been entered by the local Rail mills during the past week, and now that the current has fairly started it promises to surpass all expectations. The capacity of the mills is covered certainly to September, and probably beyond that. Those who desire Rails for early delivery are unable to get them, although they are willing to pay a premium for them. The usual quotation now made is \$33.50 for fall or winter delivery, but this price is shaded at points where competition by other mills makes it necessary. Splice Bars are in very good demand as an accompaniment of an active Rail trade, with Iron quoted 2¢ @ 2.05¢, and Steel 2.25¢. Spikes quoted \$2, and Track Bolts with Hexagon Nuts, 3¢.

**Old Iron.**—Old Iron Rails have been very active at higher prices. Several thousand tons were sold by Western railroads at about \$26, Chicago. The few holders left now ask \$26.50. The supply has been so greatly diminished that they will probably get it. Old Steel Rails are again more in demand at \$21 @ \$21.50 for long and \$18.50 for short piece. Car Wheels are quiet, but holders still ask \$19 @ \$19.50.

**Scrap.**—Scrap holds its own very well, even with many of the mills shut down and out of the market. Dealers are buying quite freely and maintaining prices. They quote selling prices as follows, @ net ton: No. 1 Railroad Wrought, \$21; No. 1 Forge, \$20.50; No. 1 Mill, \$16.50; Pipes and Flues, \$14.50; Light Iron, \$11; Machinery Cast, \$13.50; Stove Plate, \$10.50; Cast Borings, \$9.50; Wrought Turnings, \$13; Axle Turnings, \$13.50; Horse Shoes, \$19.50; Car Axles, \$25.50; Mixed Steel, \$14.25; Coil Steel, \$18; Leaf Steel, \$19; Tire Steel, \$20.

**Pig Lead.**—The market shows a somewhat easier feeling, with holders more disposed to sell. Sales covered about 300 tons, at 4.40¢.

The announcement is made to the trade that from the 1st inst. the business of

Rogers, Brown & Co., in Chicago and the Northwest, will be conducted by the firm of Rogers, Brown & Merwin. Gaius S. Merwin, who unites with the firm to this end, is a man of experience in banking as well as in the manufacture and sale of Pig Iron. W. W. Backman, long and favorably known as resident agent, will continue at the head of the selling department. Frank I. Foote will travel outside territory as before. The firm will control the agencies of over 20 important furnaces, north and south, and notably that of the great Hinkle Charcoal Furnace at Ashland, Wis., with a record of 180 tons a day. They will continue to maintain offices in the Rookery Building.

Clifford J. Ellis, formerly in charge of the Northwestern business of the Gautier Steel department of the Cambria Iron Company, has returned to Chicago from the home office and resumed the duties of his old position, continuing his office in the Phenix Building. Mr. Ellis has a wide circle of personal and business acquaintances in Chicago who have given him a cordial welcome.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St. PHILADELPHIA, Pa., July 8, 1890.

There has been no market of any account since date of our last report, so that prices are practically unchanged and nominal. Most of the large establishments have been closed for several days (and many are yet closed) for stock taking, holidays, repairs, &c., so that there was no attempt to either buy or sell. There is some little looking around to-day, more perhaps as a feeler than from any real desire to place immediate orders, although some of the large concerns are undoubtedly shaping in that direction. Sellers of manufactured Iron are not particularly anxious to do business for a few days, as they are inclined to hope for some little advance in prices. At all events, they are willing to take the risks, until it is seen what sort of a demand the next couple of weeks will develop. The majority of the mills have from two to four weeks' work on hand; and, while they are not absolutely sure of any material advance, they do feel that concessions from recent quoted rates are entirely out of the question. Small orders, however, may perhaps be taken at last week's prices, but for the present there would be some hesitation in entering large lots on terms mentioned. Prices of Pig Iron, we are sorry to say, are not as buoyant. There is a constant desire to realize in many cases on larger lots than consumers are inclined to take; the consequence is a heavy market, with weak spots constantly developing. That is to say, as soon as one lot is taken off the market another one takes its place, so that for the time being it is impossible to talk about improvement in Pig Iron, although all other specialties are steady, and in many cases strong and higher.

**Pig Iron.**—The market is heavy, and in spots there are some indications of weakness. Mill Irons are specially hard to move, unless for desirable brands, otherwise concessions of more or less importance are necessary to induce purchases of large blocks. But considering the season of the year, this feature is not significant. The temporary suspension of work at many of the mills accounts for some of the accumulations, which in course of a few weeks may be entirely absorbed. Meantime, however, there is no doubt that this class of Iron can be picked up at lower prices than were ruling a month ago, although it would not be correct to say that the market as a whole has suffered a decline. Foundry Irons are steady, and with supply not in excess of the demand, prices are maintained at \$18 @ \$18.50, delivered,



for No. 1 Foundry, and at \$16.50 @ \$17 for No. 2. Mill Irons vary from \$15.25 to \$15.75, delivered, for standard qualities, and from that down to \$14.50 for "off grades." The feeling is just a trifling nervous, and developments during the next 30 days are somewhat anxiously looked for.

**Bessemer Pig.**—The market is in *statu quo*, absolutely no business, and no great urgency to that end, by either buyer or seller. Deliveries on old contracts keep furnaces clear of accumulations, so that for the present there is no special necessity for new sales, although there is little doubt that bids of \$19.50 @ \$20, at furnace, would meet with prompt acceptance.

**Spiegeleisen.**—Holders now ask \$32, duty paid for 20 %, but there is very little demand, and \$31 would probably be all that buyers would pay for such lots as they require. Ferro is quoted at about \$75 for 80 %.

**Steel Rails.**—There is a better demand and prices are a shade dearer, say \$31.50 to \$32 at mills for large lots. Prospects indicate quite a heavy demand in the near future, while recent sales have filled the mills quite full to the middle of September. Light Rails have sold freely at about \$33.50 for 40s, \$33 for 45s, and \$32.50 for 50s. There are several inquiries for 5000 ton lots, which will probably result in business in course of a few days.

**Steel Billets and Slabs.**—There is not much actual business to report, partly because mills are too full of work to accept new business, and partly because buyers are not inclined to pay the asking prices, unless they can get more for the product. Hence it may be said that buyers and sellers are apart in their views. The last reported sale of 4 x 4 billets was at \$33.50, delivered; sellers now asking \$33.75 @ \$34, and about \$32.50 for Nail Slabs.

**Muck Bars.**—The market is irregular and unsettled, holders asking about \$29 at mills, or \$29.50 @ \$30 delivered. Buyers are not willing to concede these prices at present, as there are orders in the market which will have to be filled in course of a few days at one price or another. A sale of 500 tons was closed to-day at \$28.50 at mill.

**Bar Iron.**—The demand is not large at present; neither is there any inquiry of great importance, but as the mills are mostly shut down and have two or three weeks' work on hand, there is no particular pressure to sell, unless at full quoted rates, which are from \$1.80 to \$1.85 for best refined Bars. Manufacturers seem to think that by the time they are ready to start up there will be no scarcity of business, and that after a while better prices will prevail.

**Skelp Iron.**—There is a good deal of inquiry for Grooved Skelp, and it is probable that large orders will soon be given out at about 1.75¢. Sheared is quoted at from 1.95¢ to 2.05¢, delivered.

**Plates.**—Only a small business doing for the same reasons as mentioned in a preceding paragraph. There is a fair amount of inquiry, and orders would be placed at about 2¢, at mill, for ordinary Plates, but an advance of half tenth to a full tenth is asked, but as yet without leading to business. Lots delivered in consumers' yards may be quoted about as follows:

	Iron.	Steel.
Ship Plates.....	2.10 @ 2.15¢	2.20 @ 2.40¢
Tank.....	2.10 @ 2.15¢	2.25 @ 2.45¢
Bridge Plate.....	2.15 @ 2.20¢	2.40 @ 2.50¢
Shell.....	2.40 @ 2.50¢	2.60 @ 2.70¢
Flange.....	3.00 @ 3.15¢	2.80 @ 3.00¢
Fire-Box.....	3.75¢	3.75 @ 4.25¢

**Structural Material.**—No business of importance, but mills have plenty of work for the present, with good prospects ahead. Prices as last quoted as follows for lots delivered in consumers' yards: 2.20¢ @ 2.25¢, delivered, for Sheared Plates; 2.15¢ @ 2.20¢ for Angles, with 10¢ @ 20¢ more for the same in Steel; Tees, 2.5¢ @ 2.6¢; Beams and Channels, 3.1¢ for either Iron or Steel.

**Sheet Iron.**—A very heavy demand is reported in this department, and manufacturers find it extremely difficult to meet requirements for prompt deliveries. Thin sheets are specially active, so that prices are steady, and for carload lots are quoted as follows:

Best Refined, Nos. 14 to 20.....	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24.....	3.20¢ @ 3.30¢
Best Refined, Nos. 25 to 26.....	3.40¢ @ 3.50¢
Best Refined, No. 27.....	3.50¢ @ 3.60¢
Best Refined, No. 28.....	3.60¢ @ 3.70¢
Common, ½¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3½¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24.....	3¾¢ @ 3¾¢
Best Soft Steel, Nos. 25 to 26.....	3¾¢ @ 3¾¢
Best Soft Steel, No. 27.....	4¢ @ 4¢
Best Bloom Sheets, 1-10¢ extra over the above prices.	

Best Bloom, Galvanized, discount.....60 %  
Common, discount.....62½ %

**Old Rails.**—Market so bare of stock that it is difficult to quote exact prices. A sale was made to-day at a price equal to \$25, Philadelphia, and it is probable that large lots would be taken at that figure; but there are no spot lots for sale. In the interior \$25.50 @ \$26 is paid for small lots, but the demand is in excess of the supply.

**Scrap Iron.**—Good demand for everything on the list at about the following prices: No. 1 Wrought, \$21.50 @ \$22 Philadelphia, or for deliveries at mills in the interior, \$22 @ \$23; \$16 @ \$17 for best Machinery Scrap, \$15 @ \$15.50 for ordinary, \$15.50 @ \$16.50 for Wrought Turnings, \$11 @ \$11.50 for Cast Borings, \$25 @ \$27 for Old Fish Plates, and \$17 @ \$18 for Old Car Wheels.

**Wrought Iron Pipe.**—There is no material change in this department. The demand continues heavy, with the shortage on small sizes unabated. Discounts are well maintained as follows: Butt-Welded Black, 47½ %; Butt-Welded Galvanized, 40 %; Lap-Welded Galvanized, 47½ %; Lap-Welded Black, 60 %; Boiler Tubes, 1½ inches and smaller, 45 %; Boiler Tubes, 2 to 4 inches, 50 %; Boiler Tubes, 4½ inches and larger, 52½ %; Oil Well Casing, 50 %.

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,  
CHATTANOOGA, July 7, 1890.

**Pig Iron.**—Owing to the pending strike among the miners in the Birmingham district, prices of iron were quite stimulated, and a good many sales were made at a higher figure than the regular market rate, but as all trouble with the miners has now been obviated, the market has lapsed into its usual state, which is about the same as previously reported. While prices are firm there is no particular advance for the future anticipated. Inquiries are more numerous than they were in June, and aside from some advance on some special sales, \$12.50 No. 1 is now about the ruling rate, and there is nothing now in sight that would indicate an advance. At the same time, such is the demand that lower figures are not looked for. There are now quite an unusual number of furnaces out of blast, some of which will go into blast again in the next forty days. Shipment of pig iron is somewhat embarrassed now, which condition of affairs will probably continue for the next forty to fifty days. This is in consequence of the great demand for cars to go North loaded with fruits, &c.

## Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts.,  
CINCINNATI, July 9, 1890.

**Pig Iron.**—The dullness which has continued the most prominent feature of the local market for Pig Iron during the past week has been associated with a weaker feeling, and in some instances lower prices have been made. Buyers, at least large consumers, have been indifferent, while sellers, outside of the large furnaces, have been more anxious to sell special brands. The large Southern companies are offering only odd lots for sale before August or September, but for delivery after October considerable iron can be purchased. Yet an advance of 50¢ per ton over present prices is demanded for such deliveries. The opinion prevails, however, that contracts could be placed for fall delivery upon the basis of present prices. In exceptional instances there has been a demand for round amounts of Iron for November and December, and in one case for January delivery, but as yet the negotiations are barren. As a rule, sales have been small, transactions involving 300 to 500 tons being rare. During two days of the last week, however, business has been suspended because of the holidays, but the heated term has also been the cause of much idleness at mills and foundries. The strike at the Southern mines has ended, the labor differences having been compromised. No. 1 Southern Foundry Iron is comparatively scarce and firm; No. 2 is well sustained, but No. 3 and Gray Forge are offered in 1000 to 3000 ton lots at 50¢ decline. Salesmen upon the road are meeting encouragement, and buyers realizing that prevailing conditions are in their favor are disposed to be provoking in lack of interest shown. The talk of more stacks to blow in is used as an argument in favor of a further decline, but among the well informed it is thought that such a movement can be of little significance, and that the market will certainly give evidence of latent strength as soon as the fall business reopens into seasonable activity. The present is the dulllest time of the year, and it is only natural that a light trade should be accompanied by a weak feeling. Prices are without essential change. We quote:

### Foundry.

Southern Coke, No. 1.....	\$15.25 @ \$15.75
Southern Coke, No. 2.....	14.75 @ 15.00
Southern Coke, No. 3.....	13.75 @ 14.00
Ohio Soft Stone Coal, No. 1.....	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2.....	16.00 @ 16.50
Mahoning and Shenango Valley.....	17.00 @ 17.50
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.50 @ 20.50
Tennessee and Alabama Charcoal, No. 1.....	17.50 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	18.00 @ 18.50

### Forge.

Gray Forge.....	13.50 @ 13.75
Mottled Neutral Coke.....	13.00 @ 13.25

### Car Wheel and Malleable Irons.

Southern Car Wheel.....	22.50 @ 23.25
Hanging Rock, Cold Blast.....	22.00 @ 22.50
Lake Superior Car Wheel and Malleable.....	21.30 @ 22.00

Information is received that the DeBardeleben Company will blow in two new stacks about August 1, making five stacks blowing.

## St. Louis.

Office of *The Iron Age*, 214 N. Sixth st.,  
St. Louis, July 7, 1890.

**Pig Iron.**—The market continues in the same condition noted in last week's report. The week under review has not been a brisk one, but notwithstanding the dullness prices have been well maintained. There is some trouble in obtaining quick delivery, as most of the furnaces are well filled with orders for some time ahead. No. 1 Foundry is in good demand, and the supply of this grade is to a certain extent limited. As the market now is, the

indications are that present prices will be maintained, and with a return of the activity experienced three weeks ago, prices must necessarily advance unless furnaces are able to make shipments with more promptness than they have been doing for the past month. The outlook is considered favorable by the leading manufacturers in this locality, and even the most conservative place themselves on record as predicting the largest fall trade this city has ever experienced.

Prices are quoted as follows for cash, f. o. b. St. Louis:

Southern Coke, No. 1 Foundry,	\$16.00 @ \$16.25
Southern Coke, No. 2 Foundry,	15.50 @ 15.75
Southern Coke, No. 3 Foundry,	14.75 @ 15.00
Gray Forge.....	14.25 @ 14.50
Southern Charcoal, No. 1 Foundry.....	18.25 @ 18.75
Southern Charcoal, No. 2 Foundry.....	17.25 @ 17.75
Missouri Charcoal, No. 1 Foundry.....	17.75 @ 18.25
Missouri Charcoal, No. 2 Foundry.....	17.00 @ 17.50
Ohio Softeners.....	18.50 @ 19.00

**Bar Iron.**—There is considerable complaint in this department regarding shipments. Mills are, generally speaking, closed down for repairs, and it is almost impossible to place a good sized order for anything like immediate delivery. Prices are firmly adhered to as follows: Lots from mill, 1.80¢ to 1.85¢. Lots from store command 2¢.

**Barb Wire.**—There is somewhat of a lull in the demand, which, however, is customary at this season of the year. Prices are strictly adhered to as follows: Lots from mill at from 2.85¢ to 2.95¢. Galvanized, 3.45¢ to 3.55¢, f. o. b. St. Louis.

## Cleveland.

CLEVELAND, July 7, 1890.

**Iron Ore.**—The only interesting features of the Iron Ore trade is the overcrowded condition of the docks and the complete inability of the railroad companies to carry the Ore forward to the furnaces as fast as it is received by vessel. No new sales are reported, and it is probable that if any substantial transactions occurred the sellers would be required to make slight concessions. The furnaces are not particularly busy, and in any event the stock piles are quite sufficient for all immediate and apparent requirements. From 60,000 to 70,000 tons of new Ore have been unloaded on the local docks during the past seven days.

**Pig Iron.**—The market is without special feature. The demand for Iron is light and only scattering, and unimportant sales are reported. Many of the mills are closed down for repairs and for the mid-summer inventory. There is, however, no decline in prices, and furnacemen are as hopeful as ever of profitable quotations in the very near future. Charcoal Irons are essentially the favorites, and prices are slightly improved. Following are quotations:

Nos. 1 to 6 Lake Superior Charcoal	\$21.00 @ \$22.00
Nos. 1, 2 and 3 Bessemer.....	19.20 @ 19.80
No. 1 Strong Foundry.....	17.80 @ 18.30
No. 2 Strong Foundry.....	16.80 @ 17.30
No. 1 American Scotch.....	17.80 @ 18.30
No. 2 American Scotch.....	16.80 @ 17.30
No. 1 Soft Silvery.....	17.50 @ 18.50
Mahoning and Shenango Valley Neutral Mill Irons.....	15.80 @ 16.80
Mahoning and Shenango Valley Red Short Mills.....	16.80 @ 16.80

**Serap.**—The demand for Old American Rails at \$25.50 @ \$26 is still excellent. Old Wheels at \$19.50 are not in particular favor. No. 1 Wrought is selling at \$21, No. 1 Forge at \$20.75 @ \$21.25, and Railroad Wrought \$21.50 @ \$22.

**Nails.**—The market is firm, and there is a fair demand for Steel Wire Nails at \$2.40 and Steel Cut at \$1.95.

(By Telegraph.)

The hurricane last night destroyed nearly \$75,000 worth of Ore unloading

machinery, and has resulted in an almost complete suspension of traffic on many of the lines. So many of the furnaces are temporarily closed down, however, that the interruption will occasion little, if any, inconvenience to the consumers. The Pig Iron market is likely to remain quiet for a week or ten days, although a demand for Charcoal Iron is again being made.

## Pittsburgh.

Office of The Iron Age, Hamilton Building, Pittsburgh, July 8, 1890.

**Pig Iron.**—Business continues quiet, but it is confidently expected that there will be a considerable improvement within a week or two. The outlook is undoubtedly favorable for a healthy fall trade. Prices, as compared with those of a week ago, remain unchanged; and, while the demand is light, there is no great pressure to sell, as many of the furnaces are well sold up and have no more to sell. We quote as follows:

Neutral Gray Forge.....	\$15.25 @ \$15.75, cash.
All Ore Mill.....	16.50 @ 17.00, "
White and Mottled.....	14.50 @ 15.00, "
No. 1 Foundry.....	17.00 @ 17.50, "
No. 2 Foundry.....	16.25 @ 16.75, "
No. 3 Foundry.....	15.50 @ 16.00, "
No. 2 Charcoal Foundry.....	21.50 @ 22.00, "
No. 1 Charcoal Foundry.....	22.50 @ 23.00, "
Bessemer Pig.....	19.00 @ 19.50, "

**Muck Bar.**—There is rather more doing, but prices remain about as last quoted. \$29 @ \$29.50, cash. The enhanced cost of Old Iron Rails will, it is thought, increase the demand for Muck, as the latter is regarded as being the cheaper of the two to consumers at present prices. Mills at Wheeling are making considerable Muck for this point.

**Ferromanganese.**—We are advised of sales of some 250 tons of 80 % Ferromanganese at \$73.50, cash, at seaboard, showing a decline of \$1.50 @ \$2 1/2 ton within the past week or two. It is intimated that a desirable order would probably be accepted at \$75, delivered in Pittsburgh.

**Manufactured Iron.**—Business remains rather quiet, but the indications point to an active and healthy fall trade, which will soon open up. While it is true that for many purposes Iron has been supplanted by Steel, it is also a fact that the former, being cheaper, is holding the sway better, apparently, than a year or more ago, and for some uses Iron does as well as Steel, hence the question of price makes a difference in favor of the former. Prices are still quoted: Bars, 1.80¢ @ 1.85¢; Plate and Tank, 2.15¢ @ 2.25¢; No. 24 Steel, 2.85¢ @ 2.90; Skelp, 1.80¢ @ 1.85¢ for Grooved and 2.10¢ @ 2.15¢ for Sheared. All 60 days, 2 % off for cash.

**Nails.**—The Nail trade continues light, but will no doubt improve as the season becomes more advanced. Pittsburgh is no longer much of a Nail market; if we are not much mistaken there is not a Nail machine in operation here at the present time, and it is said that almost any of the factories here can be bought very cheap. Mention was made in this report some weeks ago of a Pittsburgh manufacturing firm having bought 5000 kegs at Wheeling to be sold in this market. Another Pittsburgh firm asked Wheeling for prices on a round lot within the past week, but the response was "none for sale at present." Steel Cut Nails may be quoted at \$2, in car lots, 60 days, 2 % off for cash. Wire Nails remains unchanged at \$2.25, 60 days, 2 % off for cash. It is worthy of mention that, while Cut Nails have been advancing steadily right along for some time past, there has been little or no change made in the price of Wire Nails, which looks as if manufacturers of the latter were trying to score a

point. The Pittsburghers cannot understand why it is that Wheeling can undersell them, as the cost of production is about the same at both points. Wheeling has no advantage whatever in the matter of transportation, as freight rates, both by river and rail, are the same.

**Wrought Iron Pipe.**—The general situation remains unchanged. Business continues fairly active. Mills are all pretty busy and likely to be for some time to come. The regular monthly meeting of the association took place in New York last week, at which there was but little done except to reaffirm former prices. Discounts on Black Butt Weld Pipe, 47 1/2 %; on Galvanized ditto, 40 %; on Black Lap Weld, 60 %; on Galvanized ditto, 47 1/2 %; Boiler Tubes—1 1/2-inch and smaller, 45 %; 2 to 4-inch, 50 %; 4-inch and larger, 52 1/2 %; Casing, all sizes, 50 %.

**Steel Plates.**—There is a continued fair business; no change in prices. Fire Box, 4 1/2¢ @ 4 1/2¢; Shell, 3¢; Flange, 3.15¢ @ 3.20¢; Tank, 2.75¢.

**Structural Iron.**—There is an increasing demand, and the indications now are that manufacturers will be fully employed during the remainder of the present year. Prices remain unchanged. Angles, 2.15 @ 2.20¢; Channels and Beams, 3.10¢; Tees, 2.75¢ @ 2.80¢; Steel Sheared Bridge Plates, 2.65¢ @ 2.75¢; Universal Mill Plates, 2.30¢ @ 2.40¢; Refined Bars, 1.90¢ @ 2¢.

**Merchant Steel.**—There is nothing especially new or important to note; business fairly active, while prices remain unchanged. Tool Steel, 8¢ and upward as to quality and brand; Crucible Spring Steel, 4¢; Open Hearth Steel, base sizes, 2 1/2¢; Crucible Machinery Steel, 4 1/2¢; Bessemer Machinery, 2.35¢ @ 2.40¢; Tire Steel, 2.50¢ @ 2.60¢.

**Wire Rods.**—There is continued inquiry, and but few of the mills are in position to take new business this side of September, being well sold up in the meantime. Brokers, after having made the attempt, report that it is simply impossible to place an order for delivery this month or next. One firm reports having had inquiries of late for some 25,000 tons. In the absence of any recent sales it is difficult to give reliable quotations, but there is no mistaking that for the time the tendency is upward.

**Billets and Slabs.**—There has been rather more inquiry the past week for Billets, and a firmer feeling obtains; most of the mills are pretty well sold ahead, and manufacturers, being impressed with the belief that prices will go still higher, are indifferent about making additional contracts. We now quote Billets at \$31 @ \$31.50. As yet there have been but few sales made above \$31, but some makers are now refusing to sell below \$31.50, and others want still more. It appears to be the general belief that prices will go still higher in the near future, and it is not strange, therefore, that makers are indifferent about making additional contracts.

**Old Rails.**—There have been no sales reported during the past week, and it is difficult to give reliable quotations in consequence. Iron Rails continue very scarce and cannot be laid down here from sources of supply West under \$27.50 @ \$28.50; but these prices are considerably above the views of consumers here, who claim that as it now stands Muck Bar is the cheaper of the two. Old Steel Rails are also in demand and hard to get.

**Railway Track Supplies.**—There is a fair business, which promises to be increased as the season becomes more advanced. Prices remain unchanged. Spikes, \$2.15, 30 days, on cars at works; Iron Splice Bars, \$1.95 @ \$2; Steel Splice



Bars, \$2 @ \$2.10; Track Bolts, \$2.85, with Square, and \$3 with Hexagon Nut.

**Steel Rails.**—There have been no sales reported the past week. Mills here are pretty well sold up for some time to come. Considerable inquiry especially for immediate or near-by delivery.

**Old Material.**—There is not much doing, but an increased business is looked for soon. Sales No. 1 Wrought Scrap at \$21 @ \$21.50, net ton, and Cast Scrap at \$16, gross; Steel Bloom Ends, \$21 @ \$21.50.

**Connellsville Coke.**—There is a continued good demand, and about the only complaint is that cars are getting scarce. No change in prices, as follows: Blast Furnace Coke, f.o.b. at ovens, \$2 15; Foundry Coke, \$2.45; Crushed Coke, \$2.65 per ton of 2000 lb. Prices at other points are as follows:

	Foundry Coke.	Crushed Coke.
On Cars at Boston and points taking Boston freight rates.	\$6.45	\$6.65
On cars at Baltimore.....	4.62	4.82
On cars at Buffalo.....	4.70	4.90
On cars at Cleveland.....	4.15	4.35
On cars at Cincinnati.....	5.10	5.30
On cars at Toledo.....	4.80	5.00
On cars at Detroit.....	4.80	5.00
On cars at East St. Louis.....	5.65	5.85
On cars at St. Louis.....	5.80	6.00
On cars at Chicago.....	5.20	5.40
On cars at Milwaukee.....	5.30	5.50

Freight rates from the regions are as follows:

To Pittsburgh.....	\$0.70
To Mahoning and Shenango valleys.....	1.35
To Cleveland, Ohio.....	1.70
To Buffalo, N. Y.....	2.25
To Detroit, Mich.....	2.35
To Cincinnati, Ohio.....	2.65
To Louisville, Ky.....	3.20
To Chicago, Ill.....	2.75
To Milwaukee, Wis.....	2.85
To St. Louis, Mo.....	3.25
To East St. Louis.....	3.20
To Baltimore.....	2.17
To Boston.....	4.00

(By Telegraph.)

There is no change in the Iron and Steel situation. Business continues light, caused in part by the intense heat, by reason of which the output of all the mills has been very much reduced. The outlook, however, is favorable. Reports from nearly all points are of an encouraging character, crops in many sections being better than expected.

## Louisville.

LOUISVILLE, KY., July 7, 1890.

**Pig Iron.**—The market was steady during the past week, without large transactions being recorded. Prices are firm, and buyers have been willing to accept the views of furnaces. The sales that have been made were mainly for delivery during three months. Some buying was based upon the contemplated strike, though but very little stress was laid upon this as it was felt that it would be one of short duration, as the present prices of Iron are not such as to warrant an advance being paid, and it was believed that the leaders among the strikers would recognize this and be willing to accept the situation.

**Charcoal Iron** has been especially firm and several large sales were made, but without an advance being recorded. The buying for July is heavier than is usual at this time of the year, and it is felt that toward the close of the month when the mills have made the necessary repairs and are in the market, an excellent fall trade will begin. We quote:

Southern Coke, No. 1 Foundry.....	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry.....	14.25 @ 14.75
Southern Coke, No. 3 Foundry.....	13.75 @ 14.25
Southern Coke, Gray Forge.....	13.25 @ 13.75
Southern Coke, Silver Gray.....	14.00 @ 15.00
Southern Coke, Car Wheel.....	22.50 @ 23.50
Southern Coke, Charcoal.....	17.50 @ 18.50

## Detroit.

**WILLIAM F. JARVIS & Co.,** under date of July 7, 1890, say: No notable changes have occurred in the Pig Iron market during the past week. It is to be observed, however, that while most of the Coke furnacemen in the South, and also for that matter in Ohio and vicinity, evince a very conservative and firm feeling, weak spots may be seen in more places than a week ago; more lots are offered for quick delivery at slight reductions, but even these lots are not sought for by our buyers, most of the larger consumers being well supplied. Jackson County (Ohio) Silveryies have been in some demand and prices on these brands have advanced 50¢ per ton. Lake Superior Charcoal figures have not altered a penny, though transactions have been quite large. The Michigan and Wisconsin furnaces are now well sold up as a rule, and while most of the largest buyers, both in the Car Wheel and Malleable trade, have placed their season orders, considerable Iron must still be bought during the next few weeks. Except on Lake Superior Charcoal we think the market dull and only fairly firm. Prices are as follows:

Lake Superior Charcoal, all numbers.....	\$20.50 @ \$21.00
Lake Superior Coke, Bessemer.....	20.00 @ 21.00
Katahdin (Maine Charcoal).....	24.00 @ 25.00
Lake Superior Coke Foundry, all ore.....	19.25 @ 20.75
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.25 @ 15.50
Jackson County (Ohio) Silvery.....	19.00 @ 19.50

## New York.

Office of The Iron Age, 66 and 68 Duane street, New York, July 9, 1890.

**American Pig.**—The market has been dull, the only news of any interest being that the Southern Coal operators have reached an understanding with their men, which puts an end to the incipient strike. Among the sales noted during the week is one lot of 1000 tons of Charcoal Iron, for delivery in this section, on the basis of \$19.50, Buffalo. We quote No. 1 Northern Iron, \$17.50 @ \$18.50; No. 2, \$16 @ \$17, and Southern Iron, No. 1, \$17 @ \$17.50; No. 1, Soft, \$16.50 @ \$16.75, and No. 2, \$16 @ \$16.25.

**Spiegeleisen and Ferromanganese.**—We hear of no transactions whatever, there being no demand and no pressure to sell. We quote 20% Spiegeleisen nominally \$30 @ \$30.50, and Ferromanganese \$72.50 @ \$75.

**Wire Rods.**—The domestic market is in a peculiar condition, owing to the temporarily largely shortened supply. We understand that the Beaver Falls mill is closed down through the breaking of the engine bed plate. Iowa Barb is idle on account of a strike; the American, at Cleveland, is making some changes in its continuous train; Oliver is rarely a seller of Rods, and the heat is curtailing the production of Joliet, Anderson and New Castle. The result is that Rods are reported to be held stiffly at \$44 at Western mill, while the last quotation of an Eastern mill was \$45 at seller's works. There are two reasons, however, why a squeeze is not likely to occur. Some of the Wire mills will probably prefer to close down rather than pay advanced prices, and secondly, Foreign Rods are available. Foreign Rods are openly quoted at \$46, although some importers claim that they cannot be done better than \$47.50 @ \$48 on the basis of 125 marks at shipping port for German basic. Still we have good evidence that even \$46 would be very materially shaded by importers, on bona-fide business. Present prices, therefore, will give the importers the tidewater market.

**Steel Rails.**—In the East the market is very quiet, the largest sale reported being a block of 3000 tons. For early delivery

orders are difficult to place, and as high as \$32 has been paid for moderate sized lots. For round blocks, early fall delivery, \$31 @ \$1.50 is a fair quotation, although at least one mill is reported to be holding at \$32. As the mill in question is pretty full, however, the quotation has no significance, except as the basis of oracular statements in the newspapers.

**Structural Material.**—No very large contracts have been placed during the week. As an interesting transaction we may note the taking of a contract by a local firm of all the structural work and all the shafting for a large cotton mill in Brazil. We quote: 2.15¢ @ 2.20¢ for Plates, 2.15¢ @ 2.25¢ for Angles, 2.5¢ @ 2.6¢ for Tees and 3.1¢ for Beams and Channels.

**Old Rails.**—This market has been very quiet, no sales of any consequence having been reported. The market continues strong, however, at \$24.50 @ \$25 nominally. Old Wheels are nominally \$18 @ \$18.50.

**Track Fastenings.**—The market for Spikes is firmer, owing to the advance in Raw Material, and \$2 @ \$2.10, delivered, is now a low quotation, the majority of sellers holding at or above the higher quotation. Fish Plates remain 1.75¢ @ 1.9¢ and Bolts and Nuts 2.85¢ @ 3¢, delivered.

## Pig Iron Warrants.

The following sales of Pig Iron Warrants are reported on the floor of the Consolidated Stock and Petroleum Exchange:

THURSDAY, July 3.

300 tons, August.....	16.14
600 tons, September.....	16.34
300 tons, September.....	16.34

## Financial.

Waiting for the Silver bill and expectancy with reference to the action of the Senate upon pending questions best describes the commercial situation, all markets being dependent on results. Nevertheless, there has been some improvement in prospect of a large crop movement now near at hand, the spring wheat harvest being good, both as to quantity and quality. It is worthy of note that the receipts of new wheat at St. Louis were large, while two loads of new wheat arrived at Chicago, and at Baltimore the receipts included new crop. Samples of new Ohio wheat were received here. Cotton, too, is coming forward, of the new crop. The first bale sold in Albany, Ga., 5th inst., at 15½¢, classed as low middling. At a meeting of representatives of Western roads in Chicago to restore rates, all the roads agreed to advance freight rates to the Missouri River and St. Paul 10¢ per 100 lb on first-class and proportionately so on the other classes. The Chicago and Northwestern was induced to withdraw its objections. Reports of European complications were emphasized by declining Consols in London.

Stock Exchange transactions excited no interest, the market being wholly of a professional character.

Wall Street takes the compromised silver bill with equanimity, conservatives feeling that this result is the best that could have been hoped for.

United States bonds were quoted as follows:

U. S. 4½, 1891, registered.....	108
U. S. 4½, 1891, coupon.....	108
U. S. 4, 1907, registered.....	121½
U. S. 4, 1907, coupon.....	121½
U. S. currency 6s, 1895.....	113

The weekly bank statement showed a decrease of \$2,796,600 in surplus reserve. In loans there was an expansion of \$7,533,300. Specie and legal tenders each increased \$1,000,000. The average rate for money on call was 6¼%. Banks and

trust companies do little, except for customers, and only at full legal rates. Quotations are 5% for four months, and 5% @ 5 1/2% for six months on approved collateral. Commercial paper quiet. The best double name paper is quoted at 5 1/2% @ 6%, and prime single name at 6% @ 7%.

Foreign exchange was quiet and firm. Business was done at 4.84 1/2 @ 4.88 1/2.

The quotations of bar silver 36 ounce were: London, 47 1/2 d; New York, \$1.04 1/2.

The substitute Silver bill reported from the Conference Committee on Monday compels the Government to buy 4,500,000 ounces of silver per month, and to pay for the bullion with Treasury notes specially issued for that purpose, the same to be full legal tender, except when otherwise expressly stipulated in the contract. It adds to the currency of the country every month, therefore, an amount equal to the total value of all the silver produced, but it gives the profit on the transaction to the Government instead of the seller of bullion.

Several changes in the merchandise markets are noted with the resumption of business this week. The breadstuffs and grain market derived new strength from reports of threatened disturbance in South-eastern Europe, storms in the corn belt and extreme hot weather in Kansas and Illinois. Provisions were dull at stronger prices, in sympathy with the West. In Chicago, however, speculation picked up a little on the strength in grain. Cotton was 1/2¢ lower for spot, due to a decided fall in Europe and favorable crop advices, especially rains in Northern Texas. The first bale of Georgia cotton left Savannah on Monday, consigned to a Wall street house. Coffee had the assistance of advanced rates on the Exchange to maintain a steady showing, but sales were light. Sugars ruled dull. New teas sell well. Other staple articles quiet and nominal. Among dry goods jobbers business as a whole is moderate, but reports from all quarters are favorable.

The sugar brokers, Willett & Gray, in their weekly circular say that "The recent decision forfeits the charter of the North River Sugar Refining Company, but does not forfeit the property. The suggestion evidently is that the trust abandon all its charters within the State, sell the properties not required in their business, and make one corporation of the properties required in the business in the State."

Eastbound shipments for last week showed a decided falling off, amounting to 28,513 tons, against 46,398 tons the preceding week, and 39,149 tons corresponding week last year.

Exports of merchandise from this port for the week, \$4,838,000; imports \$13,605,000. The exports and imports of specie about balance.

The *Railway Age*, in an article on the railway foreclosures and receiverships for the first six months of the current year, shows that from January 1 to July 1 there were 21 roads sold under foreclosure, the total mileage being 1930 miles, the funded debt \$35,930,000; total debt and stock, \$92,047,000. In the same period there were nine roads put into the hands of receivers, the mileage being 1380 miles, funded debt \$24,616,000; total bonds and stock, \$47,172,000.

The *Chronicle* gives a comparative tabular report of the listings on the New York Stock Exchange for the first six months in each year from 1885 to 1890, inclusive. For the six months this year there were listed \$368,516,500 of bonds and \$242,196,143 of stocks; the next highest issues in the same period for any of the years included being \$303,825,500 bonds in 1888 and \$168,771,174 stocks in 1889. The total for the half year of 1890 was, of course, enormously swollen by the listing of the Atchison's \$122,500,000 general

mortgage 4s and \$77,000,000 of incomes. Of the aggregate of bonds listed in that period \$94,735,250 were new issues.

## Metal Market.

**Copper.**—Transactions have been unimportant the past week. Consumers have manifested little interest in either prompt or future deliveries, and inquiries have not appeared from other sources. The tone of the market, however, is decidedly firm. Lake Superior Ingot is no longer offered at 16 1/2¢, and there seems to be a limit upon the quantity that may be obtained at 16 1/2¢. The prices generally quoted are 17¢ for prompt and near future deliveries and up to 17 1/2¢ for distant future. Arizona is still held at 15 1/2¢ and common casting brands at about 14 1/2¢. Copper, at present tied up in litigation, can, it is said, be disposed of without difficulty at prices within a fraction of those now current on the market. In point of fact, there is a standing offer of a remarkably full price for the entire amount, and it seems to be only a matter of legal proceedings that stands in the way of immediate transfer of the lot to a quarter where it will be well taken care of.

**Pig Tin.**—Prices for Straits have undergone very little change. The market has been positively dull, in fact, the trade demand showing even less spirit than is usual at this season of the year, while local speculation is almost at a standstill. Five-ton lots on the spot are quoted at 21¢, and smaller quantities at 21.15¢ @ 21.35¢. Net cash prices for 10-ton lots were 20.85¢, bid, 21¢ asked, spot; 20.85¢ @ 21¢, July; 20.80¢ @ 21¢, August, and 20.80¢ @ 21¢ September delivery.

**Pig Lead.**—Except in single carload lots there have been few transactions the past week, and the general situation is practically the same as it was a week ago. Consumers are taking hold only as imperative wants necessitate, and speculative demand is light. Holders of spot stock are firm at 4.52 1/2¢ @ 4.55¢, and producers are offering very little, if anything, for delivery this month or next. For September and later deliveries, 4.55¢ is generally asked.

**Spelter.**—Prime Western for prompt delivery is still scarce and brings 5.60¢ @ 5.62 1/2¢ in single carload lots. Near future shipments are sparingly offered also, with 5.55¢ generally quoted and 5.50¢ the lowest figures named. The demand for the metal is momentarily light, but deliveries to consumers on old contracts continue heavy.

**Antimony.**—Prices are somewhat irregular and the market rather quiet, with 21¢ @ 21 1/2¢ quoted for Hallett's, 24¢ for Cookson's, and 22¢ for LX brand.

**Tin Plate.**—There has been no improvement in the demand for either spot stock or future shipments, and prices remain practically the same as they have the past two or three weeks. Quotations for large lines, on the spot, are as follows: Coke Tins—Penlan grade, IC, 14 x 20, \$4.42 1/2; J. B. grade, do., \$4.50 @ \$4.55; Siemens Steel, \$4.65; Bessemer do., \$4.45 @ \$4.50. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$4.70; IX basis, \$5.70; Siemens Steel, IC basis, \$4.80, IX basis, \$5.80. IC Charcoals—Calland grade, 1/2 X, \$5.50; Melyn grade, \$5.70; for each additional X add \$1.50; Allaway grade, \$4.90; Grange grade, \$5.00 @ \$5.10; for each additional X add \$1. Charcoal Terres—Worcester, 14 x 20, \$4.90; 20 x 28, \$9.50; M. F., 14 x 20, \$7.00; do., 20 x 28, \$13.75; Dean, 14 x 20, \$4.55; do., 20 x 28, \$9.00; D. R. D. grade, 14 x 20, \$4.45; do., 20 x 28, \$8.90 @ \$9; Mansel, 14 x 20, \$4.50; do., 20 x 28, \$9;

Alyn, 14 x 20, \$4.50; do., 20 x 28, \$9; Dyffryn, 14 x 20, \$4.65; do., 20 x 28, \$9.10; Wasters—S. T. P. grade, 14 x 20, \$4.20; do., 20 x 28, \$8.65; Abercarne grade, 14 x 20, \$4.20; do., 20 x 28, \$8.60.

## New York Metal Exchange.

The following sales are reported:

MONDAY, July 7.

10 tons Tin, August.....20.80¢

TUESDAY, July 8.

10 tons Tin, October.....20.80¢

10 tons Tin, October.....20.85¢

WEDNESDAY, July 9.

10 tons Tin, July.....21.00¢

## Imports.

### Hardware, Machinery, &c.

Boker, Hermann & Co., Nail, cs., 11; Arms, cs., 28  
DeLaVergne Machine Company, Mdse., cs., 4  
Field, Alfred & Co., Cutlery, cs., 17; Arms, cs., 24  
Folk, J. E., Mach'y, cs., 34  
Folsom, H. & D. Arms Co., Arms, cs., 12  
Floyd, Jas. R. & Sons, Mach'y, cs., 3  
Graef Cutlery Company, Cutlery, cs., 7  
Hartley & Graham, Arms, cs., 20  
Morgan Engineering Company, Mach'y, pkgs., 12  
Merchants' Despatch Company, Arms, cs., 10  
Newton & Shipman, Files, oks., 5  
Oastler, W. C., Machinery, pkgs., 20  
Rotterdam S. S. Company, Arms, cs., 20  
Schoverling, Daly & Gales, Arms, cs., 4  
Ward, Jas. E. & Co., Mach'y, pkgs., 85  
Wiebusch & Hilger, Anvils, 100; Mdse., pkgs., 7; Arms, cs., 23  
Witte, John G. & Bro., Cutlery, cs., 8; Guns, cs., 11  
Order—Annealing Pots, 26; Machinery, cs., 8

### IMPORTS OF METALS.

Report of the imports of metals at the port of New York for the three months ending June 30:

	Quantity.	Value.
Anvils.....	957	\$7,968
Aluminum.....	30	3,851
Antimony.....	113	1,565
Brass goods.....	294	22,334
Bismuth.....	21	11,149
Chains and anchors.....	294	15,455
Copper.....		32,462
Cutlery.....	2,047	587,531
Dutch metal.....	278	76,456
Guns.....	2,337	276,163
Iron, pig, tons.....	4,454	94,425
Iron, sheet, tons.....	627	60,525
Iron, spie., tons.....	28,321	789,652
Iron ore, tons.....	8,736	16,695
Iron tubes.....	236	646
Iron cotton ties.....	13,200	9,618
Iron, other, tons.....	10,370	369,784
Lead, pigs.....	11	140
Machinery.....	3,551	270,180
Metal goods.....	9,501	517,239
Nails.....	65	3,143
Needles.....	297	58,602
Nickel.....	381	70,343
Old metal.....		5,029
Platina.....	36	193,311
Percussion caps.....	198	17,599
Steel.....	161,882	699,480
Spelter, pounds.....	542,782	26,765
Tin plates, boxes.....	587,421	2,408,517
Tin slabs, pounds.....	7,407,729	1,417,614
Type metal.....	8,160	26,594
Wire.....	2,063	87,796
Zinc, pounds.....	25,278	1,604
Steel scraps, tons.....	2,042	20,988

## Coal Market.

The Anthracite Coal market is dull and weak. The recently advanced prices being simply "on paper." The weakness arises from the abundance of Coal and scarcity of new orders. May official circulars most nearly correspond with prices now realized, but regular quotations are for Free Burning Broken and Chestnut, \$3.65; Egg, \$3.75; Stove, \$4, all f.o.b. The Philadelphia *Ledger* says: "The actual output of Anthracite for the month of June was about 3,400,000 tons, while the quantity of Coal which the managers had agreed to mine was 2,750,000 tons, that quantity being thought to be fully sufficient to satisfy the market requirements for last month. Earlier in the season well informed operators were of the opinion that the production of An-



Lieut.-Col. G. L. Gillespie, who, since the retirement of General Newton, has had charge of the work of removing the obstruction to navigation at Flood Rock, Hell Gate, states that the removal of the rock broken up by the explosion is progressing as rapidly as possible without interfering with navigation. Two dredges are constantly at work and the employment of any more would place an obstacle in the way of passing vessels. About 50,000 tons of rock have been removed in the past year, but there are still about 150,000 tons to be removed. A part of the rock is yet exposed to view, but when the work is completed there will be 26 feet of water where Flood Rock stood. The stone is loaded upon scows and dumped in the deep holes of the Gate, with a view to making a bottom as nearly uniform as possible and thus preventing the conflicting currents for which the Gate is noted.

### Official Test of the Improved Pneumatic Machine.

The first pneumatic dynamite gun made in this country for the British service was officially tested at Cold Spring, N. Y., on Tuesday, July 8, at the New York Pneumatic Dynamite Gun Company's proving grounds near that town. The test was for distance only, though several equally important features of the machine were tried in the course of the day. The contract required a throw of a 200-pound shell over a range of 3500 yards, and this part of the test was altogether successful. One of the shells, a 10-inch sub-calibre, weighing 520 pounds, attained a distance of 4008 yards; and another, an 8-inch, weighing the same amount, reached 4680 yards. The officers who attended the trials expressed complete satisfaction with this feature of the test.

The machine—for it is not a gun—was originally contracted for by the Victorian (Australian) Government, and the officials of that government had arranged to have the apparatus tested at Shoeburyness, England. While the machine was being built it attracted the attention of the British Government, and was bought by it pending the preliminary tests, the Victorian Government relinquishing its contract. Soon after its purchase by the English Government seven machines of a similar design were bought by the United States Government, and these, with one exception, are now being built at the company's West Point foundry. This one gun, which is of another design, was built by the Cramps for the Italian Government. When the new machines are completed, three of them (one 8-inch and two 15-inch) will be sent to Sandy Hook, two to Fort Schuyler and two to Fort Warren.

The machine tested on Tuesday is the largest and the most improved in design ever made in this country. Its tube is made of five lengths of charcoal iron from an air furnace, 8 inches thick, without interior lining. The entire length of the barrel is 50 feet, which is not longer than many of the new high power powder guns now being built. Its weight is 78,000 pounds. The barrel is supported on a truss. The breech is closed by a simple gate which opens outward from the valve. The entire system of the gun barrel and truss are revolved around two trunnions one-third of the way from the breech piece, which is also of cast iron. The trunnions rest in two hollow cast iron uprights resembling the chassis of heavy guns. The sight rests in V's attached to the left trunnion, a device designed by Captain Zalinski, closely resembling an ordinary theodolite. It consists of two telescopes set so that one remains parallel with the axial line of the barrel and the other at the angle of elevation. When the gun is elevated it brings the main telescope up into a level, where there are suitable graduations for elevation and for lateral movement to allow for wind and other drift, all of which is set very accurately by means of a vernier.

The engines began pumping compressed air soon after noon, and at 2 o'clock when the pressure in the storage reservoirs had reached 2000 pounds, the test began after a few preliminary air shots to insure smoothness of the various parts. The target, a big red buoy, was planted by Colonel Ryan 3500 yards up the river, near Newburg. The first projectile fired was a dummy made of pine, 8 feet long and 10 inches in diameter, weighing perhaps 250 pounds. It flew from the gun with a roar, sailed gracefully up to a height of 400 feet, and

fell precipitately after a number of turns in midair.

The next shot was in the shape of an 8-inch sub-caliber projectile, weighing something over 500 pounds, containing a charge of 200 pounds of sand. Dynamite was not employed, because of an injunction that had been granted by Judge Barnard restraining its use, on the ground that in case of premature explosion it would be followed by great damage to contiguous property, and that it would jeopardize the lives of the people at Cold Spring. This disappointed the spectators, but Colonel Ryan said it satisfied him, since the efficacy of the range was in no way impaired.

Whatever good results followed Judge Barnard's precautionary injunction were made apparent when the first projectile was fired. The moment it left the machine there was a scattering of *débris*, consisting of wooden riders, gas checks, and, much to everybody's surprise, the projectile itself. Just as it cleared away from the dust it was seen that the brass band of which the projectile was made had split. The escaping sand followed its somewhat erratic flight like the tail of a comet, the helix blades failed to steady its motion, and the shot was altogether a failure. After flying about wildly to a height of 800 feet it fell perpendicularly into the water off Cold Spring Dock.

This was a disappointment, but the engineers who have banked their money and their reputations on that machine were not a bit dismayed. Soon they had another shell ready, this time a 10-inch, weighing 520 pounds. The machine was elevated to an angle of 30° 44', and the man in charge of the compressed air cylinders announced an initial pressure of 1000 pounds to the square inch in the firing reservoirs. Then Mr. Batchellor stepped on the platform, touched the training switch, which is operated by an Edison ampere meter, took one sight through the telescope, and touched the lever.

Another great roar followed, and with it came a scatter of demolished gas checks, but through the *débris* the projectile could be seen sailing heavenward, with a course as true as an arrow. Up it went over the waters of Newburgh Bay, mounting higher and higher to a point where Stony Point and grim old Storm King far beneath would seem like the merest mole hills. Then it paused, the conical head, guided to a nicety by the wings behind it, curved gracefully downward. Constantly it increased its swiftness, gaining speed in its flight, until with a plunge it struck the water head on and disappeared, sending upward a great shaft of water and mist. Had the projectile been loaded with dynamite the explosion would have followed at the moment of impact, and the enemy—had there been one near by—would have been scattered to the four winds. This shot was nicely plotted by Colonel Ryan's observers stationed on Stony Point, and they signaled back to the men at the machine that the projectile had fallen 508 yards beyond the target, making a total range of 2½ miles, or ¼ mile further than the contract requirement.

Then the third round was fired, the projectile consisting of another 10-inch sub-caliber, its total weight with shoes and check being 530 pounds. The initial pressure was reported at 1000 pounds, and the tube elevated to an angle of 30° 43'. Again the great gun sent tremendous echoes reverberating down the valley of the Hudson. Up, up, went the glistening brass projectile in a beautiful line of flight right in the path of its predecessor. It looked like another success, but it was not. When the projectile had reached a height of 1000 feet it suddenly collapsed. In all probability it lost a feather of its tail, whereupon, like a disabled pigeon,

it tumbled over and over until it disappeared in the water, off Storm King, another failure.

But one projectile remained, this an 8-inch. Its follow had split just after leaving the tube, and the engineers gazed upon it hopefully, but anxiously. However, it was thrust into the breech, and, with 876-pound pressure to the square inch, it was sent skyward at an elevation of 30° 43'. Splendidly it mounted over the hills until it was lost to sight in the dense strata of overhanging cloud. Then it fell, and after 24 seconds of flight it flung its weight of 500 pounds down to the bottom of the placid Hudson. No failure this time, for the observers at Stony Point wigwagged back the cheering news that the projectile had fallen away over the required range.

Following this parting shot there were inquiries made as to why the first and third rounds had failed. This, it may safely be said, could not be definitely accounted for. Captain Zalinski thought the projectile was too short for the 50-foot gun. Engineer Batchellor said the casing was defective. Lieutenant Schroeder thought the sand substituted for dynamite had been disturbed, thereby changing its center of gravity. Colonel Ryan, the English officer for whose benefit the tests were made, and upon whose report depends the acceptance of the gun by his Government, said: "The machine has fully come up to its contract requirements, in so far as this trial is concerned. It has thrown a heavier shell than was required a greater distance than the contract calls for. That is all I care about, and there my participation in the trial ends."

Before passing the test of the Merriam fuse, which follows the last round, Captain Rapiéff, the Russian engineer, who designed the famous breech valve with which this gun is fitted, explained its workings. This valve has been a gordian knot in the manipulation of the machine. It has proved an intricate and a difficult problem, because volumes of air with initial pressures of 1000 pounds are difficult things to deal with. The general principle of the valve is an opening balance. Under the machine there are a series of firing reservoirs corresponding to the storage reservoirs. Two thousand pounds pressure is established in the storage reservoirs, 1000 pounds of which is transferred to the firing cylinders. These have direct communication with the central joint, and thence by side pipes to trunnions, which conduct the air through sealed passages to an annulus, or sleeve, surrounding the barrel. All this is a part of the improvement that has been made in the dynamite gun since its first appearance at Fort Lafayette.

When it reaches the breech proper the air is exhausted and allowed to escape by the valve from one side, which instantly permits the other side of the valve to open and fill again when shut. The governing idea, therefore, is that of an auxiliary valve that balances itself by allowing the air to escape from the back of the main valve, and then restores it to exactly the same place. The pressure thus regulated is not limited to 1000 pounds, and it is obvious that greater ranges can be obtained by greater pressures, but the range obtained is not directly proportionate to the pressure by any means. If greater ranges are necessary the weight of the projectile is the important factor, there being a principle of ballistics that the greater weight to the area exposed the less resistance. The training and elevating is done by electric motors arranged with switches at the firing position, one man having full control of the machine at all times. In case of the failure of the electric training apparatus there is fitted a hand training gear.



# HARDWARE.

## The Condition of Trade.

The general shrinkage in the volume of business at this season, the occurrence of a double holiday since our last report, and the extreme heat, all conspire to make trade dull. The evenness of the market in regard to prices gives comparatively few changes to report. Manufacturers also have done little in the way of revision of discounts. The condition thus remains substantially as at our last review, and it is anticipated that general business will be quiet during the month. It is probable, however, that a good many orders will be placed during the month by some of the large buyers. The situation on the whole is regarded as quite satisfactory. The following special report from Chicago indicates the condition of trade in that city:

Chicago.

(By Telegraph.)

In a number of the jobbing houses here a practical holiday was observed last week from Thursday night. July has opened up well, however, and there seems to be no cessation to the demand. Every house reports an active trade, but the salesmen will now come in quite generally for their usual semi-annual conference and a lull will be the result. It will be very acceptable to everybody, in view of the extreme heat, affording a little opportunity for rest and relaxation. The demand has latterly been running very heavily into shelf goods, although orders generally cover an assortment of heavy articles as well. Some advances in price are noted. The steel goods manufacturers have not changed their discounts as yet, but they are correcting their list prices, making an advance of 25 cents a dozen on garden tools and similar articles. Disston's Saws have been marked up from 25 and 10 to 30 and 10. In heavy Hardware the volume business in June was surprisingly large, while it is yet unusually heavy for the season. Collections are very good. The Nail situation shows no change. Manufacturers are firm, but orders are comparatively scarce. The occasional buyer, however, finds that he might as well save his time shopping round, as the makers are now very close together. They quote \$1.85 at factory, but are trying to work up to \$1.90 for ordinary specifications. For Wire Nails from factory, \$2.40, Chicago, is still named, and makers claim to be well sold up. Jobbers quote Steel Nails, \$2.05, and Wire Nails, \$2.50, from stock, with slight concessions in special cases. Barb Wire remains as reported last week, with manufacturers back in the shipments and jobbers unable to supply their customers promptly. Quotations are still 2.9¢ for Painted and 3.5¢ for Galvanized in small or large lots.

## Wire Nails.

Wire Nails continue in improved condition, and the market is characterized by a firm tone with a slight advance since our last report. Quotations at mill for carload

lots are \$2.35 to \$2.40, with advances for smaller quantities. It is obvious that the jobbers who purchased freely at the considerably lower prices lately ruling are in a position, if they choose to avail themselves of it, to make a satisfactory profit.

## Barb Wire.

Manufacturers are still well occupied with orders, but the demand, as usual at this time of the year, is moderate. Prices are without change on the basis of 3.30 cents to 3.35 cents for Galvanized Four-Point at mill, in carload lots.

## Cut Nails.

The New York market is quiet, but is steadier, Iron Cut Nails selling at \$1.75 @ \$1.80, on dock. There has been very little talk of cutting lately, cheap sellers having apparently withdrawn.

## Miscellaneous Prices.

There has been no change in the prices of Hardware Cocks, but Plumbers' Goods are slightly advanced.

Since the slight break in the price of Screw Hook and Strap Hinges and Heavy Hook Hinges mentioned in our last week's trade report, there has been a recovery and prices have advanced to where they were before. The break, we are advised, was not entirely general, and was only temporary.

Wire is steady at prices which have recently been ruling. The volume of business is moderate.

A price-list of the Gem Screw Plate, manufactured by W. S. Jones & Co., Watkins, N. Y., for whom The C. F. Guyon Company, 99 Reade street, New York, are agents, is issued. It is subject to a discount to the trade of 33½ per cent.

## Jobber Versus Broker.

The annoyance felt by the jobbers, particularly in the Heavy Hardware business, because of the brokers, has become so pronounced that a review of the situation may be of interest. Probably it is not stating the matter too strongly to admit that the broker is looked upon by the jobber as an enemy. He is accused of soliciting trade from the jobber and then visiting the jobbers' customers and selling them at the same prices he gave the jobber, in many cases bunching orders to reach the quantity necessary to secure such prices from the manufacturers. They are also represented as terming themselves manufacturers' agents, and having several lines of trade, it is said, scour the country, taking in the cross-road towns, and endeavor to antagonize the jobbers with the small buyers, representing themselves as the legitimate go-betweens, and that they are furnishing goods at manufacturers' prices. They are often supposed to talk small consumers and buyers into the idea that jobbers are taking advantage of them in more ways than one. It is also claimed that the iron mills do not seem averse to filling orders from the smaller trade, for-

warded by brokers who are traveling from or representing no particular mill, but who depend largely upon a division of profits with their customers for a brokerage. Clerks in jobbing houses often leave and become brokers, selling from the manufacturer to the jobber's former customers. Resident local agents for the manufacturer are not looked upon with so much disfavor by the jobber, nor visited with his dislike to the brokers, as they usually have authority and do not go beyond its limit. As we are advised, the dissatisfaction felt by the jobbers has been expressed only among themselves, as they feel the remedy should come from the manufacturer and not from their own action. There is also a feeling that the agitation of a subject of this kind by the jobber would put him in an undesirable light with his customers.

The fact is fully recognized that every one is desirous of buying cheaply, and if consumers receive the idea that jobbers are influencing manufacturers to take action which will result in higher prices to them, a feeling of animosity against the jobber will naturally be the result. The position is certainly an unpleasant one for the jobbers, as a continuance of the features which they claim now exist will seriously affect their business, especially if such a state of affairs is shown to be to the advantage of the retailer. But we must bear in mind the convenience that the jobber is to the retailer, in being able to supply him with a large variety of goods at a price at which the retailer can derive a profit from their sale; of the quick getting of such goods, if desired, and the accommodations often asked by the retailer and extended by the jobber in carrying him over a hard month or two. There are also advantages in profit derived by both the retailer and his customer, the consumer, when the goods are bought, whether from manufacturer or broker, at a less price than his jobber would supply them for. The retailer will give his customer the advantage of the lower price, as business policy against his competitor, and yet realize more profit than his competitor would in selling at the regular price, when the goods were not bought so advantageously. The advantage the broker has over the jobber, in being under less expense, is the same as one retailer has over his neighbor, who has more rent to pay, or who for any reason is under a heavier expense in doing an equal amount of business.

It will thus be seen that the position is somewhat complicated and without an immediate satisfactory solution. The outcome will doubtless be determined in view of the laws of trade, in accordance with which all the classes interested, manufacturers, jobbers, brokers and retailers will purchase and sell goods in the ways which, on the whole, are most advantageous to them. The difficulty in question is one phase of the relentless competition which characterizes trade with constantly increasing intensity. In the meantime the jobbers naturally look to the manufactur-

ers for a correction of the practice in question in its more objectionable forms, emphasizing the important part taken by the jobbing trade as distributors of goods. But, as bearing upon this point, we take pleasure in giving the following extract from a letter recently received from a representative Hardwareman whose views are entitled to weight:

The practice pursued by manufacturers of Iron, Steel, Nails and Heavy Hardware of placing the sale of their goods in the hands of brokers, apparently without restrictions, is one that is causing much trouble and conflict to the jobbing interests of the country, and jobbers should unite to point out the evils of the system.

The first question is: Has the jobber any recognized position in the commercial world, or has his usefulness to the manufacturer ceased? If it be decided that he is no longer of service to the manufacturer or the business community in general, of course that ends all argument. But it may be assumed that upon this subject there is not much division of opinion among manufacturers of established reputation, and to-day the jobber is recognized by them as the natural channel for the economical distribution of goods. He is indispensable to manufacturers, to whom he is constantly rendering invaluable services, which can only be recompensed by quantity rebates proportioned to service.

It may be asked in what manner is the jobber of such great service to the manufacturer? The answer is in the economical distribution of goods and the constant promotion of the interests of manufacturers. Think of the army of traveling men constantly drumming the trade, to say nothing of the large amount of money expended annually by jobbers in publishing catalogues illustrating their manufactures and advertising their goods, all of which not alone promotes his own interests to an incalculable extent, but that of the manufacturer also. Think how the distribution of goods is facilitated by the jobber and what great increase there would be in the cost of selling goods, to say nothing of the inconvenience to the business world in general were he eliminated. It is unquestioned that the jobber can sell goods at less expense than the manufacturer; in the one case the expense is divided, while in the other it must come wholly on the one line or article.

Being interested only in the amount of commissions, the broker sails in regardless of price or quantity and demoralizes things in general. This is not only an injustice to the jobber but to the manufacturer of the merchandise, and is done at his expense.

The laws of trade naturally draw quantity lines, and it is contrary to business principles that they should be overstepped. Still a broker will sell a carload of Nails by dividing them among several buyers, and at as low a price as he would sell 1000 kegs or more to one buyer. Many cases of the same nature can be shown not only in Nails but in Iron and other goods.

The broker is constantly a bear on prices, because of his selling to the smaller buyer at a price equal or nearly equal that which the jobber pays; the latter brings all the pressure he can to bear down the manufacturer, believing he should have a margin between himself and the smaller buyer.

The trouble is that brokers will not use judgment nor will they discriminate, and not being directly interested in profits they are disturbers of values.

Were it not for the conflict of jobber and broker there would not be the universal tendency to bear down on manufacturers as at present. The broker acts as a boomerang to the manufacturer in that respect as shown above.

### Trade Topics.

We take pleasure in laying before our readers the following letter from Charles N. Simms, of Simms, Workman & Best, Ronceverte, W. Va. It will be observed that he discusses the question in regard to Tags with the name of the shipper, and adduces some considerations in favor of the practice which has been quite generally condemned by other correspondents. There is certainly much force in the point he makes that the fault of which so many have complained is not with the Tag but with the house, and his remarks in regard to honorable methods of business are deserving of the best attention:

Writer has noticed discussion about printed card on shipping Tags. As no one has said a word in favor of them, would call attention to the fact that when goods come from depot all mixed up, helps locate them in sorting out. I can tell Tags by shipping clerk's writing, but the clerks do not always do it. It strikes me the fault is not with the Tag but the house. We have had letters from would-be competitors to houses we deal with forwarded to us by them for reply, beginning with "having noticed (describing goods) at depot shipped by you to — please advise what you can furnish us," &c. Now, the Tags in these cases were harmless, but would not have been if it had been one of those "half-shell" jobbers, who buy on the ground they are wholesalers, and sell a Fork or Shovel to a farmer as low as they would to a dealer by the dozen. The business methods of some houses remind me of a story I heard at a dinner in New York once. A man who was quite well known then was making a speech, in the course of which he asserted that "the business men of to-day were much shrewder than in our forefather's time, the methods and men having changed with the times." "The terms hath changedth, too," said an old gentleman next to me, "whath they termth shrewdneeth now, they calledth — rathcallity then." It strikes me it is unfortunately true as regards these "half-way houses." I must impose on your good nature long enough to give credit to one manufacturing concern. The writer did business alone for some years and had agency for the Simonds Mfg. Company, Fitchburg, Mass., on Crosscut Saws. When change in firm was first made I sent a hurried order for Saws and signed it S. & W. By next mail came letter from them saying they presumed the Mr. Simms of the firm was C. N. Simms, but could not fill order until sure of the fact, as he had been given control of the goods and they could not act on guesswork for fear of doing him an injustice. This is what we call doing business square and we think worthy of mention.

From a prominent New England manufacturer we have the following communication, which refers to the laxity of the trade in the matter of payments and the frequency with which houses in good standing fail to pay their bills with the promptness which is called for by the terms of sale:

Have been much interested in your articles concerning canceling orders. There is another growing evil in doing business now which I find more serious than canceling of orders. I refer to the growing carelessness among merchants in paying for goods according to terms. Many merchants buying goods on 30 days' time call themselves prompt if they pay in 60 days, and a manufacturer making sight draft

for past due account is apt to have draft dishonored though he notifies customer ten days or more in advance of his intention to draw in absence of advice. The merchant does not seem to consider that a manufacturer requires two capitals, one in his plant and another in material, partially finished and finished goods, and that workmen must be paid weekly. It is getting so that a third capital is required equal to a month's sales. Most manufacturers want monthly settlements, either cash or note with interest added after 30 days, but many large houses will not remit nor honor draft nor send note, but remit at their own sweet will in 60 to 90 days for a cash bill without adding interest. The responsibility for this state of things doubtless lies largely with wealthy manufacturers who are easy for money. It is, however, a serious matter with manufacturers who can only turn their capital in plant, stock and accounts once in a year and a half, while merchants turn theirs several times yearly and really gain nothing by being so unaccommodating to manufacturers.

### Binder Twine.

We are now in receipt of a communication from a hardware merchant in Virginia, in regard to Binder Twine. While there is no evidence of short weight in the 50 pound bales that the Twine comes packed in, he desires suggestions which will induce manufacturers to put the Twine in such packages as will cause less loss to the retailer. He remarks in his letter that "they put their Twine up in 50 pound packages, of Twine, sack and strings to tie and sew it up with. Now, this sack weighs 1½ pounds, the wrapping strings weigh ¼ pound, thus causing a loss of 2 pounds on each bale of Twine. This 2 pounds costs the dealer on an average 25 to 28 cents per bale. This deducted from his profit leaves him so little that there is no profit to be derived from this transaction." This subject is a large one and there is hardly a line of business where the same thing, in different forms, does not appear. Our Virginia hardwareman doubtless pays the same rate, at his grocer's, for the wooden dish containing the 2 pounds of butter he buys, as for the butter. He pays for the paper sack at the same rate per pound as for his dollar's worth of sugar. We understand it is the practice of retail men to add a percentage of each bill to the cost of the goods, covering boxing, freight and cartage. Will some of our readers let us know how they have solved this Twine question, and manage to sell it without this loss of 25 to 28 cents on a bale? We know of a dealer who always insisted on his customers taking the sack or baling when they bought a part of a bale of Twine, and weighing it in with the Twine, taking pay for the same. This was not done in an underhanded manner, as he told them he could not afford to lose so much on each ton, whereas the extra expense on one wrapper would be little to them. He used to arrange to have a half sack ready for those who did not need 50 pounds, and in this way avoided loss on the wrappers. When a full bale is sold the customer pays for the wrapper without question. It is an excellent time to decide this matter, and we are glad our correspondent has brought the matter to our notice.

### Items.

In their advertisement which appeared on page 65, of our last issue, William J. Lloyd Mfg. Company, Philadelphia, illustrated their Leopold Saw Set and their Great American Meat Cutter, giving the list prices on these goods, with a description of the different sizes made. They also issue a circular, in which they call attention to the points in regard to the



Meat Cutter on which they lay special emphasis. In addition to other important features they call special attention to the fact that the Cutter positively cuts the substance as it enters the case, and having been cut it is carried forward and again cut by the revolving and stationary knives, so that when the substance reaches the perforated plate it has been cut into pieces not over  $\frac{1}{4}$  inch, thus giving more edges or surfaces to project into the holes of the perforated plate and assisting the revolving knife in its work. The amount of meat cut in a given time and with a given expenditure of labor is also explained, and we are advised that at a recent trial their No. 136 machine, by actual test, cut 1560 pounds in one hour's time.

The Cutler & Woodrough Company, of Chicago, have been incorporated to deal in Hardware, with a capital stock of \$100,000. The incorporators are W. R. Wagner, J. H. Cutler and R. L. Woodrough.

A jobbing house known as the American Knife and Razor Company have secured quarters at 509 North Third street, St. Louis, Mo. They are strictly jobbers of American goods only, and will carry a full and complete line of all the lines represented by them, and will be in position to fill all orders received by them promptly from stock. They will handle American Knife Company's Razors, Meriden Cutlery Company's Knives, Forks and Carvers, Rogers & Bro. Silver Plated Ware and Wm. Scholthorn & Co.'s Shears. They call especial attention to these Shears, as they are made with the new tension spring, which is said to be a feature of much value. They desire correspondence from all trade in the West.

A. H. Whiting, 468 Cherry street, New York, has sold his Galvanized Iron Ware manufactory to C. O. Waite, who has consolidated it with the business of H. A. J. Helvig, 27 South street, manufacturer of Ship Lamps, Lanterns, &c. The style of the new firm is H. A. J. Helvig & Co., and it is proposed to add certain labor-saving machinery and appliances to the former plants, and with enlarged capital and facilities to greatly increase their output.

Butts & Ordway, Boston, Mass., have removed from 147 Pearl street to 498-504 Atlantic avenue, between Oliver and Pearl streets, where they occupy four floors of a building 40 x 66 feet. The basement will be used for Bar Iron and Horseshoes; the first floor for Bolts, Nuts, Washers, Bundle and Band Iron, and Carriage Hardware; Wheels and Wood stock will occupy the other floors. The building is centrally located and conveniently arranged. It will afford Butts & Ordway three times the room available in the building where they were before located, and the change will enable them to carry a much larger stock of Hardware, and add to their line of Bellows, Forges, Anvils, &c., and facilitate the dispatch of their large and growing business.

In the advertisement on page 67 the attention of the trade is called to the Mumford Extension Measure, which is manufactured by C. M. Mumford, of Springfield, Mass. It will be remembered that we recently gave a description of this article. The prices which are mentioned in the advertisement will be of interest, as well as the fact that the measures are delivered free to any point within the United States.

W. S. Hammond, of Lewisberry, Pa., is manufacturing Hammond's Window Sash Springs. These are referred to as supporting the sashes when open, and locking them when closed. The fact is alluded to that sizes and styles are made to suit all windows. The point is made that these springs are equally well adapted for use in the shop, office, dwelling,

school house and churches. We are advised they will support the sashes of the garret window, or lock those of the parlor.

Attention is directed to an advertisement among special notices on page 54, from the Oregon Immigration Board, of Portland, Oregon, addressed to bankers, manufacturers and wholesale dealers, the object of which is to direct capital to that city. The statement is made that the wholesale jobbing trade increased from \$75,000,000 to \$115,000,000 in one year, and that the manufacturing output now exceeds \$20,000,000 annually. The directors of the Oregon Immigration Board are understood to be leaders in Portland's banking and business circles, hence their statement that \$20,000,000 additional capital could find immediate and profitable employment in banking, manufacturing and wholesale trade, will command, no doubt, the attention of all seeking a new field in the growing portions of the country. These gentlemen predict that Portland will ultimately become the metropolis of the Pacific Coast. Detailed information will be given of the openings in any line by addressing the Oregon Immigration Board, Portland.

Greene, Tweed & Co., 83 Chambers street, New York, manufacturers of Blake's Belt Stud, in a recent circular, make the announcement that to meet the competition of inferior goods they have decided to offer to the trade a cheap belt fastener, under the trade name of the Empire Belt Stud, made by the same method as is the cheap fastener now on the market. They are described as made of fine brass, and as good as they can be made by the cheap method, and approximating to the shape of the patented Improved Blake's Belt Studs. They are not strengthened, however, by the swaging process described in their patent of July 21, 1883, nor are they finished in the same way. They advise us that they shall continue to make the Improved Blake's Belt Stud the same in all respects as they have in the past. To prevent deception and protect the trade, each box bears their registered trade-mark "Blake's Belt Studs," and on the opposite side a picture of a human hand cutting a slit in the belt. Attention is also called to the Manhattan Packing, for which the above firm is sole agents. It is described as being formed of a braided strip—either with or without a rubber center—filled with the finest "floated" plumbago and with an oil of very high fire test, which cannot char or ignite, and which is free from acids. This packing is designed for marine and stationary engines, locomotives, pumps, valves, steam hammers, &c.

Josiah H. Dewitt, of J. H. Dewitt & Son., Brooklyn, N. Y., manufacturers of Wire Cloth, whose residence was in this city, died suddenly of apoplexy in a cottage at Norwood Park, Long Branch, Friday night, July 4. He was sixty-five years of age. At one time he was connected with the Dewitt Wire Cloth Company, 32 Reade street, and was the originator of several kinds of Brass and Copper Wire Cloths.

Action was taken at the recent meeting of the Travelers' Protective Association by which the headquarters of the organization will be transferred from Chicago to St. Louis.

In an article, June 13, we referred to the "Pearl" Door and Window Screen Wire, manufactured by the Gilbert & Bennett Mfg. Company, 42 Cliff street, as being coated with Spelter. This, we are advised by the company, is misleading, as it is likely to convey the idea that the Cloth is made of Galvanized Wire. The Pearl Wire Cloth is described as made and

coated by composition process, the result of 15 years' experience in this specialty, and they state that their Pearl will not rust, while Cloth made of ordinary Galvanized Wire certainly will.

The organization of a company for the manufacture of Saws is reported in Newark, N. J. It will be known as the New Jersey Saw Mfg. Company, and articles of incorporation have been recorded. The capital is stated to be \$250,000, with \$13,500 paid. The articles mention the incorporators as David Almond, William M. Hammerslag, Henry Foerster, Elias Berla and Bernard Strauss, all of Newark. The incorporators met this morning and formally organized, and the following gentlemen were elected directors: George A. Halsey, Sylvester S. Baltin, Oscar B. Mockridge, Elias Berla, Henry Foerster, J. Frank Fort, William Hammerslag, Osceola Currier and Bernard Strauss. George A. Halsey was chosen president; Oscar B. Mockridge, vice-president; and Bernard Strauss, treasurer. It is, we are advised, the intention to begin work at once. Some of the parties interested have been connected with the old Richardson Company, and Mr. Hammerslag was their head salesman.

Harvey W. Peace Company, Brooklyn, N. Y., under date July 1, withdraw quotation, and refer to discount sheet applying to their list January 1, 1888. They have a new list in press which they issue at an early date. They also refer to the arrangements which they have made as enabling them to fill orders promptly.

It is interesting to note that considerations of convenience in shape, size and arrangement of catalogues are receiving due attention from some of the leading houses. Sidney, Shepard & Co., proprietors of the Buffalo Stamping Works, Buffalo, N. Y., have just issued a catalogue illustrating and describing their extensive manufactures in the line of Sheet Metal Ware. The little book is one which will find ready favor with all dealers, its compact form admitting of its being slipped into the pocket, and the arrangement of its pages being such as to facilitate ready reference. Established in 1836, this house has attained an enviable reputation in its particular field, and, following the policy of always being quick to see improvements and instant to adopt them, have just completed extensive additions their plant, substituting the latest and most approved patterns of presses, dies and machinery for all those whose excellence or effectiveness have been surpassed by recent inventive ingenuity. The firm state that they will be pleased to mail a copy of their new catalogue to any dealer upon application. Esteeming most valuable the reputation for superiority and general excellence which their manufactures possess, they advise us they will spare no expense to maintain it, and allude to their facilities and long experience as a guarantee to their patrons of lowest prices, based upon immense production, quick sales and close margins.

A Hardwareman who is thoroughly familiar with the condition of business in Illinois reports the outlook for fall trade as very satisfactory. The promise for a large business in central Illinois is especially referred to, owing to the fact that the crops of wheat, oats and corn are expected to be very large.

Thomas R. Miller and Louis Hart, of the Hart Mfg. Company, Cleveland, Ohio, are making a trip around the world, the special object of which is the still further introduction of their Stocks and Dies into foreign markets. In a recent letter, written from Sydney, Australia, they refer to *The Iron Age* as found in nearly every office, and regarded as the standard Iron and Hardware paper of Australia.

The Columbus Mfg. Company, Columbus, Ohio, who are well known as the manufacturers of Steel Skeins, Springs, &c., are now making Picks and Mattocks. They report business good and that they have orders that will occupy them for some time to come.

The Upson & Wooding Mfg. Company, Kensington, Ky., have appointed Surpluss, Dunn & Alder, 97 Chambers street, New York, general agents for the sale of their Dog Collars, which includes, we are advised, a new line of over 200 varieties. Samples may be seen at their New York Office.

The Hartford Hammer Company, Hartford, Conn., are putting on the market a line of Ball Pene Machinists' Hammers, which are described as drop forged from a special grade of tool steel and highly polished. The handles are selected from the best white hickory, and being fitted to their patented eyes, are referred to as never working loose. These goods are made in 6, 12, 20, 24 and 32 ounce.

### The Evolution of the Lawn Mower.

We are indebted to Graham, Emlen & Passmore, Philadelphia, for the following interesting history of Lawn Mowers, the development of which has been a striking feature of the Hardware trade within the past few years, the industry having grown from comparatively small proportions to its present great extent:

As far as we can learn, the first Lawn Mower having a revolving cutting apparatus was made in England by a manufacturer named Budding, in 1830. The cutters in Budding's machines were driven by a heavy iron roller placed just behind them, and while much improved from time to time, it was the type of all Lawn Mowers for some 38 years. Machines of this class were made for several years by Swift, at Newburg, N. Y., and up to 1868 were the only Lawn Mowers made in the United States. They were heavy and clumsy, especially those used by hand; a machine cutting 14 inches wide, weighed over 100 pounds; and was sold at \$65, and the sales were only a few hundred each year. The first real improvement was made by A. Hill, of Hartford, Conn., who, while still adhering to the roller type, made it much lighter; so balanced the frame that it could follow the inequalities of the ground, and used a two-bladed solid cast-iron revolving cutter in place of Swift's open cutter, in which the spiral blades were riveted on spiders mounted on a center shaft. A 14-inch Hill's Mower weighed 75 pounds, and would cut grass 5 inches high, and, though still heavy and awkward and sold at \$45, it was such an improvement that the sales at once jumped to several thousand. In 1869 Passmore, of Philadelphia, Pa., got out the first side-wheel Lawn Mower. Discarding the heavy iron roller, he used two driving wheels, and placed the cutting apparatus between them and to the rear of their axle. This machine proved to be about what was wanted, and being sold at the then low price of \$28, the sales were at once enormously increased. Passmore's original machine (sold under the trade name of the "Philadelphia") had driving wheels 10½ inches in diameter and weighed 62 pounds; but experience showing that a smaller wheel would run easier, the wheels were reduced to about 7 inches diameter, and the weight of the 14-inch to 38 pounds. So great was the success of the new side-wheel Lawn Mowers, that they soon had possession of the market, and to-day comparatively few other kinds are made, either in this or foreign countries; and from a few hundred in 1866 in the

the United States, the sales have increased to some 50,000 in 1889, while the retail price of the best makes now is only \$8, in place of \$65 in 1866. The manufacturers also claim that the Lawn Mower has been an agent in assisting to create that love for suburban life that has been so markedly on the increase during the past 15 years, but whether the Lawn Mower is one of the causes or one of the results of this, we leave each of our readers to judge for themselves. Certain it is that well cut lawns make most of us want to live among them.

We are also indebted to Thomas Coldwell, president of the Chadborn & Coldwell Mfg. Company, Newburgh, N. Y., for the information that Budding was superintendent for a firm at Strand, Gloucester, England, who made cloth-shearing machines which suggested the idea of a Lawn Mower on the same principle. There is also, we understand, some disposition in England to question the claim of Passmore, of Philadelphia, as the manufacturer of the first side-wheel Mower, it being intimated that one was made in Leeds at an earlier date. There is, however, no definite evidence to maintain the English claim, and as the matter now stands the honor seems to belong to Mr Passmore.

### Price-Lists, &c.

Greene, Tweed & Co., 83 Chambers street, New York, with factory at Birmingham, Conn., issue a comprehensive catalogue of over 200 pages descriptive of their goods. This is fully illustrated, and shows Machinists', Mill, Railroad, Engineers' and Manufacturers' Tools and Supplies. They also issue a number of separate circulars relating to special articles which they are putting on the market.

E. N. Scoville, Manlius, N. Y., manufacturer of patent Perfection Oil and Molasses Gates and patent Ale and Beer Faucets, issues a catalogue descriptive of these goods. The Perfection Gates are adapted to many uses, being made in special designs for Cans, Churns, Water Faucets, Ale and Beer Faucets, &c. These Gates are referred to as having been subjected to the most severe tests for the past four years and as having given satisfaction. The simplicity of their construction, the ease and convenience with which they are operated, the perfect finish of each, are all points to which allusion is made.

The Bailey Auger Bit Company, Lancaster, Ohio, issue a price-list of the Bailey Augers and Bits manufactured by them. These comprise Auger Bits, Dowel Bits, Boat Bits, Hand Rail Bits, Machine Dowels, Machine Bits (with turned shanks) Boring Machine Augers, Car Bits (12-inch Twist) Carpenters' Augers, Millwrights' Augers, Auger and Car Bits, assorted in sets, and sets of Boring Machine Augers. The point is made that all their goods are solid cast steel. Reference is made to the fact that any half or medium sizes will be furnished at the same prices as the next regular size larger.

Felton, Rau & Sibley, Philadelphia, Pa., importers and manufacturers of Varnishes, Japans and Superfine Colors, issue an 1890 catalogue and price-list of these goods. The Varnish factories of this firm are at Hestonville and Frankford. This list is of convenient size, and will doubtless be appreciated by those who handle paints.

The Jeffrey Mfg. Company, Columbus, Ohio, issue an illustrated catalogue for 1890 of the Chain Belting, Elevating and Conveying Machinery manufactured by them. Attention is directed to important

improvements in the Chain department, on the Mey-Oborn Chain. Reference is also made to the Sheldrick Chain, as being a particularly desirable detachable Chain. In the Mining Machine department, their Electric Mining Machines, Drills and Motor Cars are alluded to as being deserving of especial attention. A portion of the catalogue is devoted to testimonial letters, largely from manufacturing industries in which their appliances have proven satisfactory.

The Gong Bell Mfg. Company, East Hampton, Conn., for whom Sargent & Co., New York, and Geo. W. Van Tine & Son, Philadelphia, Pa., are general agents, issue an illustrated catalogue for 1890 embracing the goods made by them. These goods cover a line of Abbe's and Yankee Patent Gong Door Bells, Trip Gong Bells, Hose Carriage Bells, Copper and Tin Tea Bells, Cone's Patent Globe Hand Bells, also a large variety of styles of Table Call Bells. They also issue a very interesting catalogue of Bells and Bell Toys, manufactured by them expressly for the Toy and Fancy Goods trade.

The Canton Saw Company, Canton, Ohio, manufacturers of Solid and Inserted Tooth Circular Saws, Knight's Patent Saw Mill Dogs, Class See-Saw and Merry Go-Round, Rolling Cutlery, &c., issue an illustrated price-list of these goods. They also give valuable information to sawyers about selling and running Circular Saws. A list is given for prices for repairing Circular Saws from 6 inches to 72 inches in diameter.

The Chicago Hose Reel Company, 99 and 101 Erie street, Chicago, manufacturers of Fire Apparatus and Supplies, issue an illustrated catalogue of Hook and Ladder Trucks, Hand Hose Carts, Factory Reels, Lawn Hose Reels, Lawn Sprinklers, &c. They show on a separate sheet the Chicago Sprinkler, which they allude to as weighing but half as much as the old style, and state that when not in use the folding base allows the Sprinkler to be compactly packed for shipment or storage.

The Chattanooga Saw Works, 521 to 523 Broad street, Chattanooga, Tenn., issue a comprehensive illustrated catalogue and price-list of Circular Saws, Engines, Boilers, Saw Mills, Wood Working Machinery and Mill Supplies. A special notice about ordering Saws, embodying the following suggestions, may be of interest to those selling or using Circular Saws. For mills of ordinary capacity, doing general work, Saws seven gauge at the center and eight on the rim are recommended. If the timber is valuable and the sawyer skillful, an eight by nine gauge or nine by ten gauge may be used. The greater the speed and feed used the heavier the Saw should be to stand up to the work. With a high speed more teeth are required, therefore should not depend alone on the thickness of the Saw, but on the kind of timber to be sawed and the speed and feed of the mill.

The Champion Lawn Rake Co., Canton, Ohio, issue an illustrated price-list of the Lawn Rakes manufactured by them. In addition to those shown, next season it is thought they will have some new Rakes which will embody substantial improvements.

Henry E. Dean & Co., 180 Austin street-Worcester, Mass., manufacturers of Stand, and Wire Goods, Special Hardware and Housekeeping Goods, issue a catalogue of these goods, also a number of small slips showing some of the lines they are adding to their various other Wire goods. These slips show Pot Cleaners, the Dean Spring Steel Wire Cushion, Culinary Rollers, Doughnut Lifters, Towel Holders, Window and Sink Cleaners, Portable Plate Racks, Perfection Pillow Sham Holders,



Spiral Egg Beaters, Wheel Mouse Traps, &c. They refer to having had a special machine made for manufacturing Wire Wagon Cushions, of which they are at present furnishing a large number.

The Cincinnati Bell Foundry Company, Cincinnati, O., send out a catalogue containing description and prices of church, school, and fire alarm Bells. The catalogue also contains over 2000 testimonials from purchasers. The prices are referred to as being comparatively low and within the reach of even weak churches.

The United States Clothes Pin Company, Montpelier, Vt., issue circulars illustrating the styles of Clothes Pins manufactured by them. Nos. 1, 2 and 3 are for Clothes Pins, No. 4 for Carriage Trimmings and No. 5 for photographers' use. They are referred to as having numerous advantages over the Split Pins.

The Mansfield Buggy Company, Mansfield, Ohio, issue a catalogue illustrating Vehicles manufactured by them. These are shown in a variety of styles, and hung on different kind of springs. Allusion is made to their furnishing work in the white if desired, trimmed and ironed ready for the paint. They also furnish any part of a Buggy, if so ordered.

S. A. Brown, 385 Washington street, Buffalo, N. Y., issues circulars illustrating goods manufactured by him. These consist of Matrix Press and Automatic Vulcanizer, for making Rubber Stamps. This is referred to as a successful dry heat machine. Brown's Whisk Broom Holder, which is a cast frame and attached to the wall for holding whisk brooms. Brown's Stop Cock Box for putting over gas and water service cocks, consists of two shells, the upper sliding over the lower, being held in place at any desired point. Many advantages over other boxes now in use are claimed for it.

H. D. Edwards & Co., 16 to 24 Woodward avenue, Detroit, Mich., issue a handsome 188-page catalogue and price-list descriptive of the large line of goods handled by them. These consist of Mill and Mining Supplies, Belting, Fire Hose, Cordage, Ship Chandlery and Marine Hardware. The front cover of the catalogue is printed in colors, a center piece illustrating Rope, Belting, Oars and Fire Hose in an artistic arrangement. Around this is a rope border. The back cover shows the stores occupied by the firm. The India Rubber warehouse was established in 1855.

Chambers, Bering Quinlan Company, Decatur, Ill., issue circulars descriptive of the large line of Agricultural Implements manufactured by them. Prominent among these are their U. S. Combined Check Row Corn Planter, Hawkeye Rake Loader and a Side Delivery Hay Rake. Besides these they make Batines and C. B. & Q. Check Rowers, Hawkeye and C. B. & Q. Hay Carriers, Hay Forks and Pulleys, Champion and Brown Hog Rings and Ringers, Hog Holders and Animal Catchers.

The Alford & Berkele Company, 77 Chambers street, New York, who are sole agents (except for New Haven, Conn., and the Pacific Coast) for the sale of the Lightning Nail Puller, manufactured by the Ellrich Hardware Mfg. Company, Plantsville, Conn., issue a circular relating to the device. An illustration of the Puller is given and the advantages connected with it enumerated. Its weight is stated to be 5½ pounds.

The Hopkins & Dickinson Manufacturing Company, 260 to 268 Gold street, Brooklyn, with their New York office at 88 Reade street, issue a tasty little circular, bound in light fancy paper, tied with blue cord, descriptive of their Columbia Cylinder, to which we have already referred. The manufacturers claim that

while all the good features of Cylinder Locks are retained, defects usual to locks of this class are overcome in the Columbia.

T. F. Cheriton Hardware Company, 92 Chambers street, N. Y., are introducing a Paragon Coat and Hat Hook, which they allude to as a new pattern of a Coat Hook, a prominent feature in the design of which is an oval and broad surface for the better protection to hats and coats hung on them. These Hooks are made with a wrought iron screw, and also with two holes through which screws may be inserted.

The Todd-Donagan Iron Company, 817 to 821 West Main street, Louisville, Ky., issue a supplement to their catalogue No. 1, illustrating Wrenches, Drop Forged Steel Lathe Dogs, Drills, Taps, Iron Machine Screws, Spring Collars, Flat Spring Keys, Lane's Patent Tackle Blocks, Batt's Patent Improved Differential Pulley Blocks, Corrugated Steel Fasteners, &c. They also make a line of Lumbermen's Tools. This supplement is to be inserted in their catalogue No. 1.

### Suggestions About Ordering Goods.

1. Write only on one side of the paper when ordering goods. The other side is apt to be neglected, and it is inconvenient for reference after the order is filed away.
2. Do not mention a remittance, and order goods both on the same sheet of paper. The remittance, in whatever form it may be sent, whether a draft, money order or an express order, goes to the cashier, and the statement that you sent it should be in shape to accompany it to insure you getting credit for the amount. The order will go to the order clerk.
3. Use one sheet for the remittance and another to write the order on, to insure prompt attention for both.
4. Do not send an order and a complaint about a former bill of goods or a claim for reclamation on the same paper. The trouble about which you write will have to go to the claim clerk for adjustment, while the order will go to a different part of the house to be filled.
5. It is better not to write part of your order and then introduce some other subject foreign to the order, after which continue your order. The stock clerk who is getting out your order has no interest in any remarks which do not refer directly to the order before him.
6. Not signing orders is more common than one would suppose. It leads to much annoyance and delay. Even if you have a printed letter head with your name and business on it, a house might not be justified in not filling it unless they first wrote to see if the order had your sanction. If they filled an order supposing you wrote it, they would have no proof you sent it if for any reason you did not want to pay for the goods when the bill became due, or for some reason refused to receive the goods.
7. Do not fail to stamp the envelope; the neglect of this often sends the letter to Washington, D. C., to have the stamp sent, before the letter can reach its destination.
8. Write plainly so the parties cannot help understanding what you want. Do not crowd what you have to say, but take another sheet of paper to finish.
9. Give both the number and size of an article so they can make no mistake.
10. Do not abbreviate too much. A ½ gro. T Spoons may mean either Tea or Table Spoons, and you would be almost sure to get what you did not want. Be sure to state whether you want Wire or Cut Nails. Carpet Tacks are both plain and tinned. Chisels are made either firmer or framing and so on through the list.

11. There are many other suggestions which might be given which are just as important as those mentioned. We should be pleased to hear from some of our friends on the subject.

### Retailers' Credits.

The invitation for a full discussion of Retailers' Credits, given in a recent issue, has met with a gratifying response. We give an extract from a letter of one of our Western readers, in which he alludes to the system of protection referred to as having worked well for the past three years in a city of a population of 6000. He also makes the point in which many will agree with him, that the pernicious credit business should be checked in some way, as goods are sold too close to admit of many losses. Our correspondent says:

We organized a branch of the Merchants' Retail Commercial Agency, of Chicago, Ill., and had nearly every business man in our city on the membership roll. The cost was six dollars per annum for blanks, lists, &c., furnished by the Chicago agency. Our first notice to a delinquent was a printed form with blank spaces for name, amount, &c., in the following terms:

LOCAL BRANCH AT.....  
.....188.....

M.....

DEAR SIR:

We are members of the above agency, which, as you will observe, is organized for the purpose of affording protection to retail merchants against that class of persons who have no regard for their promises to pay.

Your unsettled account due us now amounts to.....dollars. We shall regret being forced by your negligence to place the account in the hands of above agency for adjustment.

Unless you call upon us within.....days from date hereof, and pay the amount due, or pay part of it, and arrange for payment of the balance, or give us some good reason why you cannot settle it in whole or in part, we shall certainly place the account with "The Merchants' Retail Commercial Agency, of Chicago, Ill.," for collection.

Hoping to hear from you within the time specified, we remain,

Yours respectfully,

If no response came in the time specified, the member sent name, address and amount to the Chicago office, who sent the debtor a similar though much stronger appeal than the first one, to call on his creditor and settle or have his name appear on the dead-beat list, which is published every quarter by the Chicago agency. This list is distributed by the secretary of the local branch to each member; they having pledged themselves, on joining, not to give credit to any one while his name remains on the list.

The advocates of this plan point out that there is nothing in the notice sent the delinquent to which any exception could be taken, nor anything which is intended to make him angry. We can easily imagine, however, the feeling of consternation that would come to a man who should by the same mail, or succeeding mails, receive five or six of these notices from as many firms whom he owes. He would begin to feel that something had dropped; that it was unfair to take advantage of his unfortunate position and cut off his supplies; that it was strange treatment to receive from firms who had carried him for six months, and had bothered him with one or two statements during that time; and finally would induce himself to believe he was grossly insulted. The strength of this

organization appears to be in its numbers, which prevents a delinquent to one merchant from getting credit at his competitor's, and forces him to pay cash for everything until his old account is settled. Care should be taken not to antagonize the customer when he comes to pay or explain why he cannot pay, because it is a double gain if the merchant can retain him as a friend and also get his money. The quarterly lists which are furnished enable the merchant to avoid getting on his books any one reported for unpaid accounts.

There are doubtless other plans for accomplishing the same end, and we should be pleased to receive reports from the trade in regard to this question.

The following extract from the letter of an occasional correspondent touches upon the subject and explains the method adopted in the instance to which it refers. There seemed to be both a need and a way of remedy:

Some eight years ago, in a Kansas town of 2500 population, the merchants felt assured in their minds that some concerted action must be taken against those who were constitutional dead beats, and those who gave all the trouble they could before they would pay, under pressure. The exemption law was much in favor of the householder against the merchant; immigration was also large, and they had got to a point where they must do something. A meeting was called one evening at which a large enough number were present and enough interest manifested to justify an organization. The proper officers were elected to serve one year, and the plan in general was as follows: Each merchant or firm were to prepare a list of names of all on his or their books who had not paid their accounts as they promised to, or who had not paid for six months, having been requested either by mail or in person to do so. Care was to be taken to do no one injustice, nor were any to escape who had the semblance of beats. These names were to be copied into as many books as there were members, each member being entitled to a book. Letters were placed after each name to show the kind of business the party was indebted to, H. for Hardware, D. G. for Dry Goods, &c., but no one but the secretary would know which firm reported any individual. These books were to be revised each month, new names, if there were any, added, and those who had paid were stricken out. No merchant was to trust any one who was indebted to any other member of the association, and the strict observance of this rule was the life of the association. A fee for membership was charged, also small monthly dues, both to be applied to paying bills for stationary and secretary's salary. They met in the town hall, so had no rent to pay.

It did not take long for the man who owed to find that there was a concerted action being brought to bear upon him, not in a public denouncement as a fraud or glaring printed cards or envelopes coming through the mails, stating by the printing on the outside that they were to be returned to a dead beat collecting agency if not called for in ten days. He was politely informed that he was indebted to a firm or firms in a certain line or lines, as the case may be, and that until satisfactory evidence that these accounts were paid the merchant could not extend him further credit. He was urged to pay his debt, that the merchant might trust him again. He would, perhaps, try some other store and meet with the same polite, but firm reply, until he was made to see in spite of himself the necessity of putting

himself on a paid up basis, or thereafter pay cash for everything. The merchants who would not go into this arrangement—and about 25 per cent. would not—got this class of undesirable trade, and soon filled their books with uncollectable accounts. At last report this association was in flourishing condition.

There seems to be two things that must be kept in mind in any plan developed: First, that a large proportion of the business men in any town, at least 75 per cent., should signify their willingness to co-operate; and, second, that they should, as one of our correspondents expresses it, "keep everlastingly at it." The matter of credits is one which should be given constant and painstaking attention.

Relating to the same subject, we have the following from a Hardwareman who writes from Long Island:

I think one of the best plans to protect the business men of a community is to make what is called the black book. Get the business men together and have each one hand in a list of deadheads who continually go from one store to another evading paying their honest debts. Then place these names on this black book and each business man have a copy thereof in his office, I think retailers' credit would find it very difficult to get his customers to sign a blank form, as many people become indignant when called upon to sign their name. Many of them would object and leave you. The old saying, it takes many minds to form a world, will hold true in business matters.

### Our Competitions.

The Committee of Award in the Second Prize Competition have reached the following decision: That the first prize be awarded to C. T. Rosenthal, Batesville, Ark., and the second prize to J. S. Clark, Cleveland, Ohio. At the same time they make mention of the special interest and merit of the contributions of other competitors.

In subsequent issues we shall take pleasure in giving descriptions of the methods of the competitors to whom prizes have been awarded, and also of others which, though not successful so far as winning of prizes is concerned, are possessed of exceptional merit. In the information thus gathered it will interest our readers to know that some new and excellent devices are brought to light, and we are confident that the Hardware trade of the country will appreciate the information which is thus presented to them. It is to be hoped that the result will be the adoption of improved methods and a more careful attention to the important department to which these competitions relate.

A correspondent inquires with reference to the length of articles which are entered in these competitions, pointing out that nothing is said on this point in the announcement of the competitions, and intimating that it would be desirable if there were some limit to their length. In reply we would say that this matter was intentionally left to the judgment of each competitor, as the committee of award is in a position to decide wisely in regard to the merit of the different contributions submitted. The object of these competitions being to obtain descriptions of desirable

methods, it is to be presumed that the committee would desire descriptions sufficiently full to make the method clear, while any unnecessary prolixity would be regarded with disfavor. In these competitions clearness and conciseness with all requisite fullness are doubtless desirable, and we would suggest that competitors bear in mind the object of each competition and prepare their contribution with it in view. For their convenience, as well as to direct attention to the subjects still open for discussion, we give below the terms of the competitions which are still to mature:

#### No. 3.—Marking Prices.

The object of this competition is to secure descriptions of approved methods of marking prices for salesmen's use.

If one or more ciphers are used their method of use should be explained, with examples of the markings of different goods.

If price-cards are used their arrangement, size, method of use, location in store, &c., should be explained.

Attention should be given to the different ways in which prices of different kinds of goods are marked, such as Shelf Goods, Heavy Hardware, Metals, Cutlery, &c.

FIRST PRIZE.....\$100  
SECOND PRIZE.....50

This competition will remain open until the close of business, July 31, 1890.

Contributions are to be addressed to *The Iron Age*, 66 and 68 Duane street, New York, marked "Prize Competition No. 3."

#### No. 4.—Good Buying.

The object of this competition is to secure papers in regard to buying. It is intended to call out information as to how advantageous prices may be obtained, the system adopted in regard to ordering goods, and such practical suggestions in regard to the matter as will represent the principles to be followed by careful and successful buyers. In this connection an explanation should be given of the method by which the buyer is advised in regard to the goods required, whether by the use of want-book, stock-book, the records of business of the past year or otherwise. Samples should also be given of any blanks used.

FIRST PRIZE.....\$100  
SECOND PRIZE.....50

This competition will remain open until the close of business, August 30, 1890.

Contributions are to be addressed to *The Iron Age*, 66 and 68 Duane street, New York, marked "Prize Competition No. 4."

#### No. 5.—The Use of The Iron Age in Hardware Stores.

The object of this competition is to secure essays relating to the use to be made of *The Iron Age* in connection with the Hardware business, whether in its advertising or reading columns. It is desired that competitors express their views on the subject in a practical and business-like way.

FIRST PRIZE.....\$100  
SECOND PRIZE.....50

This competition will remain open until the close of business, September 30, 1890.

Contributions should be addressed to *The Iron Age*, 66 and 68 Duane street, New York, marked "Prize Competition No. 5."

#### Exports.

PER BRIG AQUATIC, JUNE 11, 1890, FOR PORT NATAL, SOUTH AFRICA.  
By Racine Wagon and Carriage Company.—  
2100 pounds Road Carts.



By Coombs, Crosby & Eddy.—51½ dozen Hardware, 10 dozen Axes, 80 Plows.  
 By H. W. Peabody & Co.—10 Wheelbarrows, 22 packages Hardware, 1 case Pumps, 2 cases Axes, 11,200 pounds Barb Wire, 2 packages Barrows, 12 dozen Hoes, &c., 1 case Iron Castings.  
 By Corner Bros. & Co.—4 cases Agricultural Implements, 3 cases Hardware, 114 cases Agricultural Implements, 104 Plows, 6 Pumps.  
 By Marcial & Co.—3 dozen Sad Irons, 6 dozen Hatchets, 5 dozen Axes, 4 cases Washing Machines, 18 kegs Horse Shoes, 5000 pounds Nails, 6 dozen Hammers, 7 dozen Braces, 6 dozen Mouse Traps, 6 dozen Pulleys, 12 gross Screw Eyes, 10 dozen Wrenches, 64 Plows, 50 pairs Plow Handles, 19 dozen Saws, 10 dozen Corn Knives, 24 Saws, 12 dozen Hinges, 18 dozen Drills, 193 pounds Washita Stone.  
 By W. H. Crossman & Bro.—29 cases Hardware, 31 packages Agricultural Implements, 1 case Razor Stroops, 5700 pounds Nails, 1000 pounds Horse Hoes, 840 feet Rubber Hose, 4 coils Rubber Hose, 1 case Nozzles, 1076 pounds Jute Rope, 106 dozen Hardware, 2 packages Plated Ware, ½ dozen Scales, 19 packages Agricultural Implements, 13 cases Hardware, 300 pounds Nails, 2 gross Stove Polish, 1 case Sash Weights, 1 bundle Sash Cord, 1 case Hardware, 10½ dozen Hardware, 7 dozen Churns, 84 dozen Hardware, 5 cases Agricultural Implements, 5 Scales, 800 pounds Nails, 3 cases Hardware, 4 dozen Hardware, 16 dozen Rakes.

PER BANK PAUL, JUNE 11, 1890, FOR  
ADELAIDE, AUSTRALIA.

By Graphite Pencil Company.—2 cases Lead Pencils.  
 By Arkell & Douglas.—4155 pounds Axes.  
 By Edward Miller & Co.—18 packages Lamp Goods.  
 By Meriden Britannia Company.—1 box Plated Ware.  
 By Joseph Dixon Crucible Company.—437 pounds Lead Pencils.  
 By Fairbanks & Co.—62 boxes Scales.  
 By W. H. Crossman & Bro.—2240 pounds Iron Nails.  
 By Dunbar, Hobart & Co.—4480 pounds Nails.  
 By Mailler & Quereau.—1 case Machinery.  
 By Welsh & Lea.—9 cases Hardware, 1 barrel Wagon Jacks, 1 case Rakes.  
 By R. W. Cameron & Co.—48 dozen Axe Handles.  
 By McLean Bros. & Rigg.—22 dozen Saws, 2 dozen Pumps, 5 dozen Stencils, 18 dozen Gate Latches, 1 dozen Lawn Mowers, 1 Wringer, 6 Breast Drills, 9 Windmills.  
 By W. E. Peck.—2 cases Plated Ware.  
 By R. W. Forbes & Son.—3 packages Hardware, 4 packages Castings, 2 cases Hardware, 8 packages Lawn Mowers.  
 By H. W. Peabody & Co.—5 cases Iron Castings, 5 cases Agate Ware, 1 case Upstoppers, 12 cases Agate Ware, 2 dozen Rakes, 196 packages Hardware, 3 cases Oil Stoves, 1 bale Rubber Goods, 26 cases Glue, 24 packages Lawn Mowers, 2 cases Ice Machines, 12 coils Hose, 48 dozen Traps, 12 dozen Buckets, 41 packages Lampware, 53½ dozen Lemon Squeezers, 6 Revolvers, 1300 Cartridges, 2 cases Thermometers, 6 Air Guns, 336 pounds Packing, 2 dozen Lawn Sprinklers, 4 crates Traps, 1 case Stencils, 2 cases Axes, 4 cases Hardware, 1 case Wire Cloth, 1 bundle Taps and Dies, 4 cases Lawn Mowers, 1 bundle Scissors, 1 Chuck, 5 dozen Silver Plated Ware, 36 dozen Curry Combs, 1 case Lampware, 14 packages Hardware, 1 dozen Carpet Sweepers.

PER SHIP WANDERING JEW, JUNE 17, 1890, FOR  
MELBOURNE, AUSTRALIA.

By Meriden Britannia Company.—14 packages Plated Ware.  
 By Geo. N. Pierce & Co.—13 Refrigerators.  
 By St. Louis Stamping Company.—723 pounds Granite Iron Ware.  
 By Dunbar, Hobart & Co.—13,440 pounds Nails.  
 By F. B. Wheeler & Co.—1 barrel Lamp Goods.  
 By W. A. Wood.—1944 packages Harvesters and Binders.  
 By Gutta Percha and Rubber Mfg. Company.—642 pounds Rubber Hose.  
 By W. K. Freeman.—916 pounds Locks and Knobs, 8 cases Hardware.  
 By Hammacher & Delius.—2 dozen Hatchets, 7 dozen Garden Rakes, 1 case Hardware, 7 kegs Nails.  
 By B. F. Avery & Sons.—6 boxes Planters and Corn Rowers, 6 packages Plows, 12 packages Planters and Corn Rowers, 3 Stalk Cutters.  
 By Winchester Reporting Arms Company.—3 Guns, 6000 Metallic Cartridges, 7 Rifles, 14 sets Tools, 33,000 Cartridges, 30,000 Cartridge Shells.  
 By A. S. Lascelles & Co.—34 dozen Axes, 13 dozen Hatchets, 3 dozen Locks.

By Healy & Earl.—2 cases Sandpaper, 2 cases Drilling Machines.  
 By Welsh & Lea.—2 cases Snaths, 3 cases Hardware, 4 cases Axes.  
 By R. H. Dana & Co.—21 dozen Wrenches, 27 dozen Forks, 15 dozen Axes, 60 kegs Nails, 14 dozen Saws, 40 dozen Fly Traps, 7 cases Hardware, 3 cases Flint Paper, 10 Ice Cream Freezers.  
 By Coombs, Crosby & Eddy.—10 gross pencils, 8 dozen Silver Ware, 6 dozen Axes, 4 dozen Bench Screws.  
 By McLean Bros. & Rigg.—24 dozen Gate Latches, 1 package Harvesting Machinery, 6 cases Agate Ware, 13 dozen Carpet Sweepers, 2 dozen Wheelbarrows, 1 Wringer, 48 dozen Hoes, 120 Plows, 2 dozen Locks, 6 cases Harvesting Machine Parts, 463 packages Harvesting Machinery, 15 boxes Harvesting Machinery.  
 By A. Field & Co.—1500 pounds Hardware.  
 By R. W. Cameron & Co.—3 cases Sandpaper, 10 barrels Iron Wire, 1 box Machinery, 12 dozen Scoops, 10,000 Cartridges.  
 By R. W. Forbes & Son.—18 dozen Hammers, 6 packages Hardware, 12 cases Axes, 9 packages Hardware, 3 cases Freezers, 12 cases Wire Goods, 3 cases Picture Cord, 3 cases Lampware, 1800 feet Wire Cloth, 1 case Stamped Ware, 1 box Toys, 1 case Fish Rods, 5 cases Lampware, 6 dozen Axes, 3 cases Bird Cages.  
 By H. W. Peabody & Co.—16,000 pounds Nails, 7 cases Tacks, 3 cases Springs, 9 cases Hardware, 2 cases Iron Castings.  
 By Arnold, Cheney & Co.—4280 pounds Iron Wire.

## REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

### Paints and Colors.

Business in this line of trade has been of rather small proportions the past week. Nothing has occurred having a tendency to prompt buyers to depart from the extremely conservative policy that is usually followed at this season of the year, and manufacturers and jobbers have taken advantage of the double holiday to put through the details of semi-annual inventory. In point of fact, the purchase and sale of goods was practically set aside by a number of local firms during the first half of the week under review, and the wheels of trade have as yet hardly been started in motion. The general outlook is considered favorable for fully the average midsummer season distribution, and, aside from the uncertainty surrounding White Lead prices, there are no circumstances that would prompt more than ordinary caution on the part of buyers.

**White Lead.**—The demand has been chiefly of a retail character, and rather slow at that, with orders from the out of town trade noticeably few. In other words, it is a summer season market in the fullest sense of the term. Corrodors identified with the National Lead Trust adhere to former prices, and it does not appear that outside manufacturers have made any concessions from the figures current last month. Jobbers are still taking orders for 1000-lb and smaller lots at or very close to the corrodors' list prices for 12-ton lots, and rarely quote above 6½¢ for the most popular brands.

**Red Lead and Litharge.**—List prices are the same as current for several weeks past, and seem to be closely adhered to by manufacturers, although departed from to some extent by jobbers. The demand is momentarily quiet.

**Zincs.**—Prices for American are firm and unchanged. The same may be remarked of foreign. Trade has been rather slow during the week, although showing some improvement the last few days.

**Colors.**—Quicksilver Vermilion is very firm at the advanced prices made last week, and for the general line of House Painters' and Grinders' Colors values hold quite steady. At the moment trade is rather slow, however, and the demand unimportant.

**Miscellaneous.**—Block Chalk has undergone no change, arrivals being little, if at all, in excess of the requirements. Whiting has fair movement at steady prices, as do also Paris White, Barytes and Terra Alba.

A large factory for the manufacture of Paints is being erected at North Penn Junction in Philadelphia, by the Pecora Paint Works. The building is of stretcher brick, three stories and a high basement in height. It is of slow burning mill construction, with heavy floors for supporting White Lead and other heavy material used in the business. It is 43 x 107 feet in dimensions, with a high tower on one side, 10 x 18 feet for the fire tanks. There is a boiler house in the rear, 23 x 35 feet. The engine is to be placed in the basement, and will drive into a belt shaft.

**Oils and Turpentine.**—No changes of striking importance have taken place in prices during the week, and transactions of other than a strictly routine character have been few and far between. However, the general distribution in a jobbing way has kept in line with what is usual for this season of the year, and fairly good tone characterizes the market throughout. High cost still serves to check consumption of Linseed Oil, though encouraging the use of substitutes, and, with a more ample supply of raw material later on, modified prices are probable. Otherwise, values seem to be on a low basis and the chances are more in favor of higher prices later on than any movement in the other direction.

**Cotton Seed Oils.**—While including no extraordinary quantities, dealings in Cotton Seed Oil have been of somewhat larger proportions and sufficient to show a decidedly steady market. Exporters have purchased Summer Yellow at 32½¢ @ 33½¢ for "off" grade, and 36¢ for prime quality. The latter has brought 36½¢ in fair sized lots from the home trade, and 38½¢ was obtained for Summer White.

**Linseed Oil.**—The demand for this article is rather slow at the present time, and the market is without new or interesting feature. A larger crop of American Seed is expected this season, but the present supply is light and crushers are not offering Oil any lower for either prompt or near future delivery.

**Lard Oil.**—The dealings in this commodity have been of strictly routine character and moderate, all told, yet sufficient to keep prices steady in the absence of any material change in the cost of raw material. For present make prime 50¢ is the general quotation.

**Fish Oils.**—Of new crude Menhaden the arrivals have been moderate, but the supply has rather exceeded the outlet and prices have ruled rather weak. Good merchantable quality was sold at 22½¢, or ¼¢ below the general quotation. There has been no change whatever on crude Sperm or crude Whale. Manufactured Fish Oils in general are steady at former quotations.

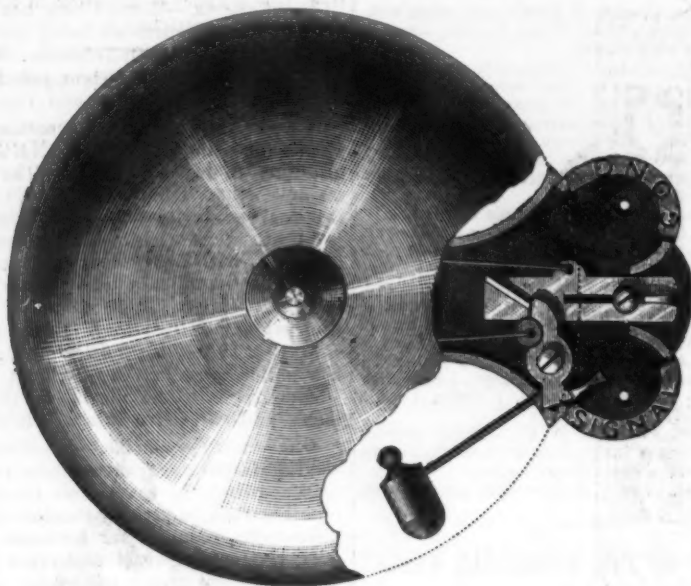
**Miscellaneous.**—Firm prices are the rule on Olive, Coconut and Palm Oils, but there is little or no movement of round lots of either of the several lines of goods.

**Spirits Turpentine.**—Arrivals have been heavy, increasing the supply here to about 2000 barrels, but fairly brisk demand offsets that feature in a great measure, and prices are remarkably firm. A good business has been put through the past few days, chiefly at 40½¢ for "regulars" and 41¢ @ 41½¢ for "machines."

### Trip Gong Bell.

The Gong Bell Mfg. Company, East Hampton, Conn., are introducing a trip gong bell, as illustrated herewith, a portion of the bell being broken away to show the mechanism. These trip gongs are especi-

ally designed to use wherever a signal bell is needed. The mechanism of the bell is alluded to as pulling from the center. The point is made that this arrangement is of the most simple kind, as well as durable, with all working parts concealed under the bell. Attention is directed to the fact that gongs 10 inches in diameter and upward are furnished with lignumvitæ wood hammers.



Trip Gong Bell.

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### Deal's Combination Padlock.

The Canton Combination Lock Company, Canton, Ohio, are introducing a combination padlock, as illustrated here-



Deal's Combination Padlock.

with. The combination is referred to as being set on any number of buttons from two up to nine, and instantly opened by pressing upon the buttons corresponding

to the numbers on which it is set, and is thus similar in principle to a drawer lock of their manufacture, recently described. The buttons, it is stated, return to their place as soon as the pressure is removed. If a wrong button should be pressed, it is explained, the lock cannot

be opened without first bringing the combination into place by pulling upon the knob. The lock closes on a spring and is designed to lock upon the combination by pulling on the knob. These locks are made in real bronze and imitation bronze finish.

### Cook's Patent Levels.

Davis & Cook, Watertown, N. Y., are manufacturing Cook's patent iron plumb



Fig. 1.—Iron Plumb and Level, No. 25.

and levels in the new patterns shown in Figs. 1 and 2. Fig. 1 represents level with a cast iron frame 18 inches long on the longest edge, 2½ inches wide and 1½



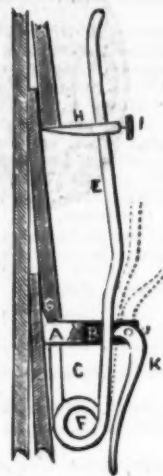
Fig. 2.—Iron Plumb, Level and Square, No. 20.

inches thick on the edge, weighing about 3 pounds. They also make an iron plumb, level and square, Fig. 2. The plumb and level glasses are fastened in a nickel plated metal ring, protected by glass, this inner ring being set in an outside ring, which is fastened to the frame by screws. Countersunk screws in the face of the

frame are used to adjust the level glasses. The inside ring must revolve on the outside ring in adjusting, and we are advised there is no up and down or side motion whereby the level can get out of adjustment.

### Hosack Siding Gauge.

S. G. Hosack, 77 Broadway, Ann Arbor, Mich., is manufacturing and introducing a siding gauge bearing his name, as illustrated herewith. It is referred to as being an improvement in sliding gauges, designed for a cheap, easily operated device, which can quickly and safely be secured to



Hosack Siding Gauge.

the side of a building without the use of hammer or other tool. From the illustration it may be seen that the distance between the upper side of the adjustable finger H and the upper side of the transverse bar A is used to regulate the exposed surface of the siding. The spur G is to be introduced by pressure of the hand under the lower edge of the last nailed

siding board. The lever K is then drawn down to cause the pointed end of the finger H to penetrate the surface of the board. The point is made that these gauges are manufactured from the finest steel, nickel plated and polished.

### The Reidy Patent Horseshoe Cushion.

B. S. Hale & Son, Malden, Mass., manufacturers of horse specialties, are



Reidy's Patent Horseshoe Cushion.

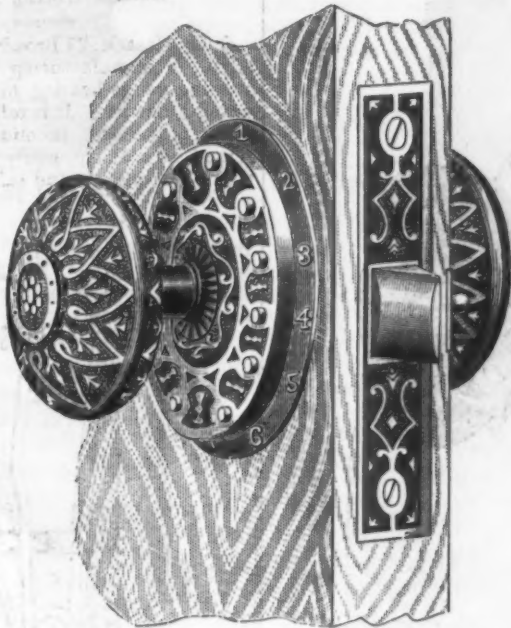
introducing the Reidy Patent Horseshoe Cushion, as illustrated herewith. This cushion is made of rubber and is designed to cure and prevent concussion, con-



traction, corns, shoe boils, expanding the hoof and to relieve all tenderness of the feet and soreness of the corns. It is described as an oval rubber band, about  $\frac{1}{4}$  inch thick, terminating at the ends in a heavy cork or cushion. Its general shape is that of a horseshoe, the rubber cushion

to the numbers on which it is set; the buttons, it is stated, return to their place as soon as the pressure is removed. It is explained should a wrong button, however, be pressed, the lock cannot be opened without first bringing the combination into place by pulling upon the knob, after

stirrup, which operates the belt, thereby securing the free use of both hands to use in holding the article to be sharpened. The stirrup is brought down to a comfortable and easy working position, when the foot is introduced. The wheel is referred to as being heavily coated with the best of fine emery. We are advised that the sharpener is quick in operation and a durable article.

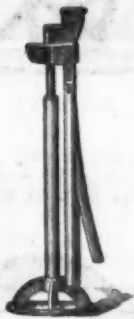


Deal's Combination Mortise Door Lock.

representing the heel corks. An iron plate shoe goes with this, and the heel ends are shortened to give room for the rubber corks. The rubber shoe goes against the foot and is nailed on with the iron shoe, the whole forming an iron plate shoe with rubber heel corks.

#### The Victor Wagon Jack.

The E. Covert Mfg. Company, Farmer Village, N. Y., manufacturers of specialties in saddlery, coach and general hardware, are introducing the Victor wagon



The Victor Wagon Jack.

jack, as illustrated herewith. The jack is referred to as having great strength and lifting power, sufficient to raise 1600 pounds. The important features of this jack are alluded to as simplicity, light weight, great leverage power, durability and convenience. It is made of all iron and weighs 7 pounds.

#### Deal's Combination Mortise Door Lock.

The Canton Combination Lock Company, Canton, Ohio., are introducing a combination door lock, as illustrated herewith. The combination is referred to as being set on any number of buttons from two up to 11, and is instantly opened by pressing upon the buttons corresponding

which the combination can be worked. The point is made that the door is locked either by pulling the knob on the outside or by pressing on the knob from the inside. The lock is designed for the uses of an all-purpose lock, to be always opened from the inside by means of the little catch near the knob, and also to be so arranged, in an instant, that it will not lock by any movement or use of the knob. It is mentioned that changes of combination can be readily and quickly made without removing the lock from the door, and the number of possible changes are said to exceed a million. Attention is called to the fact that the locks can be opened as easily in the dark as in the daylight. The locks are made in brass, bronze or nickel finish, furnished with or without knobs to match.

#### The Peerless Emery Wheel.

G. T. Moore, 112 Chambers street, New York, is introducing the Peerless emery wheel knife sharpener and tool grinder, as



The Peerless Emery Wheel.

illustrated herewith. It is alluded to as being made with a compound ratchet movement, designed to gain high speed. It is operated by using one foot in the

#### Crescent Edge Iron Strapped Blocks.

Walter Coleman & Sons, Providence, R. I., are introducing a Crescent Edge Iron Strapped Block, as illustrated herewith,



Fig. 1.—The Crescent Edge Iron Strapped Block.

Fig. 1. The edges of these Blocks are alluded to as being crescent in shape, the cross section of a cheek showing the same radius of a curve, which gives to

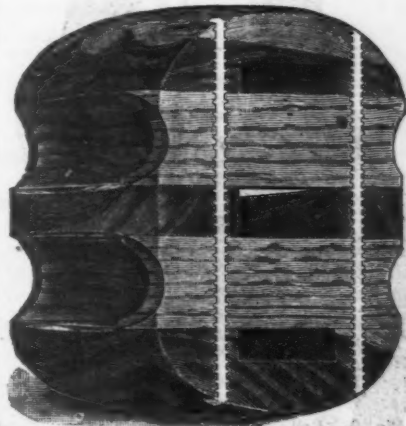


Fig. 2.—Top of Shell Sawed Off Showing Screw Wire.

them an attractive appearance. An important feature in the construction of these blocks is the use of a screw wire taking the place of rivets, Fig. 2, thus giving a grip on the wood, the whole length of the thread, without regard to length, which is not obtainable when a rivet is used, either upset on a washer or

on the wood. Another advantage of the screw wire is mentioned as allowing them to finish the periphery of a block to any desired shape after the wire is inserted. This pulley is described as having great strength and beauty in appearance.

#### Bonanza Snow Shovel.

The Gifford Mfg. Company, Watertown, N. Y., are introducing their Bonanza No. 2 Snow Shovel, as illustrated herewith.



Fig. 1.—Bonanza Snow Shovel.—Front View.

They refer to the handles as being rock elm or oak, steamed and bent to shape, being placed near the edge of the blade to give additional strength. The lifting braces are bolted to the handle, the lower one being designed for throwing out heavy



Fig. 2.—Bonanza Snow Shovel.—Rear View.

snow. The blade is described as being made of three thicknesses of birch, one thickness lengthwise and the other two crosswise the grain, making a light and substantial blade. We are advised that the steel edge extends 2 inches up the handle, forming a shoe. The point is made that the whole shovel is dipped in oil, giving it good protection, hardening the surface when dry.

#### The Czar Horse Medicine Bottle.

The New York Belting and Packing Company, 15 Park row, New York, are introducing a horse medicine bottle, as illustrated herewith. This is a bottle made

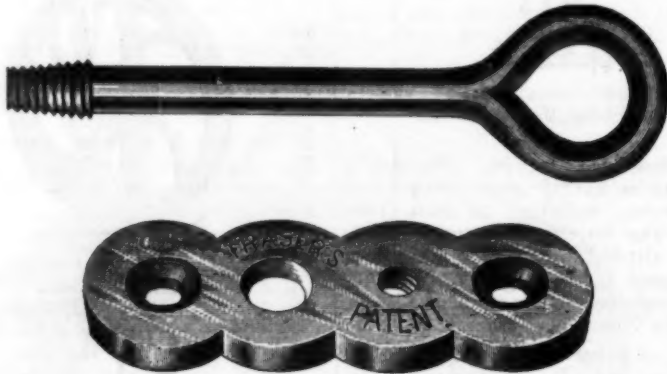


The Czar Horse Medicine Bottle.

of solid rubber, 10½ inches high, 3¼ inches diameter at the bottom. The rubber at the neck is ½-inch thick. It is alluded to as an elastic indestructible bottle, indispensable for the proper administration of medicine to horses.

#### Fraser's Lightning Lifting Screws.

The Eagle Pattern Works, Donald Fraser, proprietor, 245 Lake street, Milwaukee, Wis., manufacturers of wood and metal patterns, are introducing a lightning lifting screw, as illustrated herewith, to be used in connection with their improved rapping plates. The lifting screw is designed to fit into the hole in the rapping plate and enable the molder to draw the pattern



Fraser's Lightning Lifting Screws.

steadily, thereby obviating the breaking down the edges of the molds. We are advised that these screws are cut standard sizes at the points, and the threads being tapered are intended to take up all wear of the threaded hole.

#### Patent Cast Thread Iron Fittings.

Gleason & Bailey, Seneca Falls, N. Y., and 189 Mercer street, New York, are manufacturing a line of Cast Thread

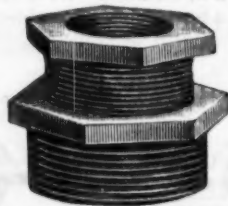


Fig. 1.—Patent Cast Thread Bushings.

Iron Fittings, some of which are illustrated in Figs. 1, 2 and 3. They refer to these fittings as being stronger than others, as by their process of casting the

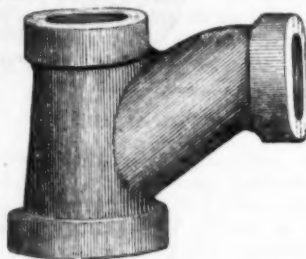


Fig. 2.—Patent Cast Thread T. Y.

thread, the scale, which is the strongest part of the castings, is preserved, while in all others it is destroyed by the tool cut-

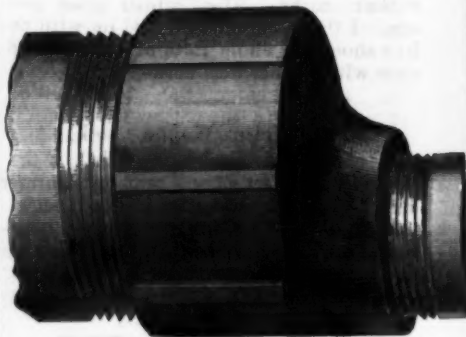


Fig. 3.—Patent Cast Thread Eccentric Reducers.

ting or tapping the thread. The point is also made that these Fittings are superior in quality and accuracy to any cast fitting

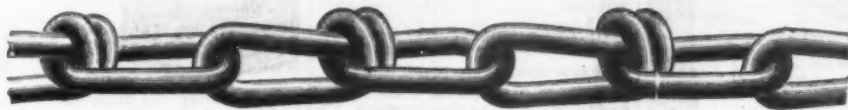
with cut or tapped thread. Besides the fittings shown in Figs. 1, 2 and 3, they manufacture Flanges, Bossed Flanges, Flange Unions, Plugs, Caps, Reducers, Branch Trees, Floor and Ceiling Plates. We are advised that from time to time they will



add to their list such regular or special fittings as the trade will demand and which they can furnish.

### The Brown Patent Wire Chain.

The Bridgeport Chain Company, of Bridgeport, Conn., are introducing the "Brown" Patent Wire Chain, as illustrated herewith. It will be seen that the

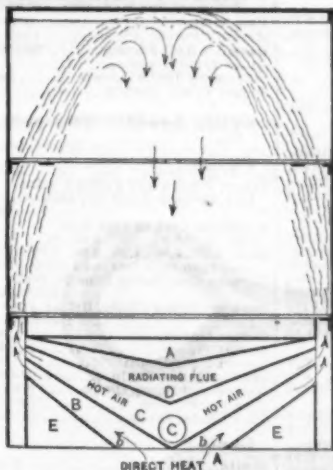


The Brown Patent Wire Chain.

chain is simple in its make-up, and designed for strength. We are advised that as soon as the line of sizes is complete, these chains will be made up for different purposes and catalogued the same as the "Triumph" chains. Samples will be mailed by the company upon application.

### Moon's Patent Oven.

In the accompanying illustration we present a sectional view of an oven which has lately been patented and placed upon the market by George R. Moon, 211 South street, Wilmington, Ohio. This device is designed especially for use in connection with gas, gasoline and oil stoves, and is claimed to be so constructed as to properly equalize the heat for baking purposes. The arrangement of parts is such, the manufacturer states, that a greater proportion of direct heat is delivered to the top of the oven without overheating the bottom. In the accompanying illustration the various arrows indicate the direction of the heat as it passes from the burner to the oven. It first enters the small inclined flue marked B, in the engraving, where it is confined for a brief space of time, and then carried upward to the side walls of the oven to a point on a level with the lower grate. It is then dispatched in a straight current and delivered at the top of the oven, heating it from that point downward, and at the same time keeping up a brisk circulation through the openings in



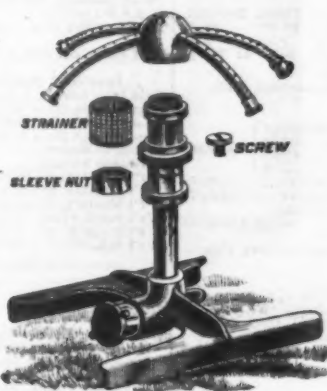
Moon's Patent Oven.—Sectional View Showing Course of Heat.

the flue C, and the ventilating flues at the ends of the oven. This arrangement, the manufacturer states, results in an even temperature throughout the oven, while at the same time there is a saving of nearly one-quarter in fuel, for the reason that no direct heat is used below the lower grate. An even temperature through the oven bakes on all sides alike, and it is not necessary to move articles within the oven from one side to the other in order to obtain good results.

### Fountain Lawn Sprinkler.

The Enterprise Mfg. Company, of Philadelphia, Pa., are introducing the Enterprise Fountain Lawn Sprinkler, as illustrated herewith, which is described as being durable and simple in construction, with interchangeable parts. Its working parts are brass, nickel plated, and the construction is referred to as such that

the weight of the revolving parts is sustained by the pressure of the water, with a view to over coming unnecessary wear. The sprinkler is referred to as running at any pressure from 5 to 100 pounds. The water passes through a strainer before entering the perforations, the strainer being intended to prevent the dirt from stopping up the small holes. The point is made that it can be used as a lawn sprinkler or fountain. We are advised



Enterprise Fountain Lawn Sprinkler.

that the numerous fine jets which the revolving motion distributes in graceful curves make it especially attractive when in operation.

### PERSONALS.

Chas. B. Brush has been appointed associate engineer with Thos. C. Clark to superintend the construction of the contemplated great North River Bridge, from this city.

W. M. Carr has accepted the position as chemist of the Southwest Coal and Coke Company, of Mount Pleasant, Pa.

Jerome Wheelock, of Worcester, Mass., has gone abroad.

J. Macdonald, of James Watson & Co., the great Glasgow iron firm, has returned to Europe after a prolonged stay in this country.

The submarine cable just laid between Halifax and Bermuda consists of five sizes—the Bermuda shore end, about 6 inches in diameter; the Halifax shore end, two "intermediates," and the deep sea section. The cable conductor consists of a strand of seven copper wires, 120 pounds per knot, insulated with three alternate coatings of gutta percha and Chatterton's compound; 150 pounds per knot. This core is covered with a serving of jute yarn stepped in "cutch" or preservative mixture applied wet and then whipped with three-thread jute yarn to keep the serving in place. The deep sea cable is served with 10 No. 0.099 galvanized homogeneous

iron wire, and the intermediates with smaller sizes. The whole is served with two coats of Russian hemp, laid on in opposite directions, and three coatings of bituminous compound, the first of which is put on next to the wires and the others over a layer of yarn. W. T. Hanley & Co., of London, were the manufacturers.

James A. Richards died on the 5th inst., at South Chester, on his sixty-fourth birthday. He was born in Oley Township, Berks County, Pa., and was for many years prominently identified with the early iron industry of Eastern Pennsylvania. In 1852 he went to Columbus and built the old Shawnee rolling mill, one of the first merchant and bar iron mills in the State. In 1872 and 1873 he built the Lochiel blast furnace, at Harrisburg. He was engaged for many years in successful prospecting for and mining iron ore in York, Adams, Franklin and Cumberland counties, Pa., and in the rich iron ore districts of Southwest Missouri.

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# CURRENT HARDWARE PRICES.

JULY 9, 1890.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Adjusters, Blind.

Domestic..... \$ dos \$3.00, 33¢  
Excelsior..... \$ dos \$10.00, 50¢  
Washburn's Self-Locking..... 30¢

## Ammunition.—

Caps, Percussion, No. 1000—  
Hicks & Goldmark's and Union Metallic  
Cartridge Co. 15¢

F. L. Waterproof, 1-10's..... 34¢  
E. B. Trimmed Edge, 1-10's..... 40¢  
E. B. Grnd. Edge, Cent. Fire, 1-10's..... 40¢

Musket Waterproof, 1-10's..... 50¢  
G. D. B. Genuine Imported..... 50¢  
Jey's E. B. .... 50¢  
Jey's D Waterproof, Central Fire..... 50¢

Cartridges—  
Rim Fire Cartridges..... 50¢  
Rim Fire Military..... 50¢  
Cent. Fire, Pistol and Rifle..... 50¢  
Cent. Fire, Military and Sporting..... 50¢

Blank Cartridges, except 22 and 32 cal.,  
additional 10¢ on above discounts.  
Blank Cartridges, 22 cal., \$1.75..... 2¢  
Blank Cartridges, 32 cal., \$3.50..... 2¢  
Primed Shells and Bullets..... 15¢  
E. B. Caps, Round Ball, \$1.75..... 2¢  
E. B. Caps, Con. Ball, Swg'd., \$2.00..... 2¢

Primers—  
Berdan Primers, \$1.00..... 2¢  
B. L. Caps (for Sturtevant Shells) \$1.00..... 2¢  
All other Primers, \$1.20..... 2¢

Shells—  
First quality 4, 8, 10 and 12 gauge..... 25¢  
First quality, 14, 16 and 20 gauge (\$10  
list)..... 30¢  
Star, Club, Rival and Climax brands..... 40¢

Selbold's Comb. Shot Shells..... 35¢  
I. X. L. 10 and 12 gauge..... 40¢  
"Special," 16 gauge..... 40¢  
"Special," 10 and 12 gauge..... 40¢  
Fowler's Pat..... 40¢  
Brass Shot Shells, 1st quality..... 60¢  
Brass Shot Shells, Club, Rival, Climax..... 65¢

Shells Loaded—  
Standard List..... 40¢  
Wads—Price per M.  
U. M. C. & W. R. A.—B. E., 11 up..... 68¢  
U. M. C. & W. R. A.—B. E., 9 & 10..... 82¢  
U. M. C. & W. R. A.—B. E., 8..... 90¢  
U. M. C. & W. R. A.—B. E., 7..... 1.10  
U. M. C. & W. R. A.—P. E., 11 up..... 1.15  
U. M. C. & W. R. A.—P. E., 9 & 10..... 1.50  
U. M. C. & W. R. A.—P. E., 8..... 1.70  
U. M. C. & W. R. A.—P. E., 7..... 1.80  
Eley's B. E., 11 up..... 1.75  
Eley's P. E., 11 & 20..... 2.80

Anvils—  
Eagle Anvil, \$ 104..... 15¢  
Peter Wright's..... 10¢  
Armstrong's Mouse Hole..... 9¢  
Armstrong's Mouse Hole, Extra 11¢  
Trenton..... 9¢  
Wilkinson's..... 9¢  
J. & Riley Carr. Pat. Solid..... 11¢  
Moore & Barnes Mfg. Co..... 33¢

Anvil Vice and Drill—  
Millers Falls Co., \$18.00..... 20¢  
Cheney Anvil and Vice..... 25¢  
Allen Anvil and Vice, \$3.00..... 40¢  
Star..... 45¢

Apple Parers—See Parers, Apple,  
Ac.

Augers and Bits—  
Douglas Mfg. Co..... 70¢  
Wm. A. Ives & Co..... 70¢  
Humphreysville Mfg. Co..... 70¢  
French, Swift & Co. (F. H. Beecher,  
P. S. & W. Co.)..... 70¢  
Rockford Bit Company..... 70¢  
Cook's, Douglas Mfg. Co..... 55¢  
Cook's, N. H. Copper Co. 50¢  
Ives' Circular Lip..... 50¢  
Patent Solid Head..... 50¢  
O. E. Jennings & Co., No. 10, extension  
lip..... 40¢  
C. E. Jennings & Co., No. 30..... 60¢  
C. E. Jennings & Co., Auger Bits, 3/4 set,  
32¢ quarters, No. 5, 8; No. 30, 35¢, 20¢  
Lewis' Patent Single Twist..... 45¢  
Russell Jennings' Augers and Bits..... 25¢  
Imitation Jennings' Bits..... 60¢  
Snell's Jennings Pattern..... 60¢  
Pugh's Black..... 60¢  
Rockford, Jennings' Pattern..... 60¢  
Car Bits..... 60¢  
Car Bits, P. S. & W. Co..... 60¢  
Snell's Car Bits..... 60¢  
L. Hommedieu Car Bits..... 15¢  
Vorster's Pat. Auger Bits..... 10¢  
Cincinnati Bell-Hangers' Bits..... 30¢

Bit Stock Drills—  
Morse Twist Drills..... 50¢  
Standard..... 50¢  
Cleveland..... 50¢  
Syracuse, for metal..... 50¢  
Syracuse, for wood (wood list) 30¢  
Williams' or Holt's, for metal 50¢  
Williams' or Holt's, for wood..... 40¢  
Cincinnati, for wood..... 50¢  
Cincinnati, for metal..... 45¢

Expansive Bits—  
Clark's small, 1/8; large, 3/8..... 35¢  
Ives' No. 4, \$ dos \$60..... 40¢  
Swan's..... 40¢  
Steer's No. 1, \$20; No. 2, \$25..... 35¢  
Stearns' No. 2, \$48..... 20¢

Gimlet Bits—  
Common..... \$ gross \$2.75 @ \$3.25  
Diamond..... \$ dos \$1.10..... 25¢  
Bee..... 25¢  
Double Cut Shephardson's..... 45¢

Double Cut, Ct. Valley Mfg. Co..... 30¢  
Double Cut, Hartwell's, \$ gro..... 45¢  
Double Cut, Douglass..... 40¢  
Double Cut, Ives..... 60¢

Hollow Augers—  
Ives..... 33¢  
French, Swift & Co..... 33¢  
Douglass..... 33¢  
Bonney's Adjustable, \$ dos \$48..... 40¢  
Stearns'..... 30¢  
Ives' Expansive, each \$4.50..... 30¢  
Universal Expansive, each \$4.50..... 30¢  
Wood's..... 25¢  
Cincinnati Adjustable..... 25¢  
Cincinnati Standard..... 25¢

Ship Augers and Bits—  
L'Hommedieu's..... 15¢  
Watrous..... 15¢  
Snell's..... 15¢  
Snell's Ship Auger Pat'n Car Bits..... 15¢

Awl Hafts—See Hafts, Awl.

Awls, Brad Sets, &c—  
Awls, Sewing, Common \$ gr \$1.70, 35¢  
Awls, Should. Peg \$ gr \$2.45, 40¢  
Awls, Pat. Peg..... 40¢  
Awls, Shouldered Brad..... 35¢  
Awls, Handled Brad..... 45¢  
Awls, Handled Scratch \$ gr \$7.50, 35¢  
Awls, Socket Scratch \$ dos \$1.50, 35¢

Awl and Tool Sets—See Sets, Awl  
and Tool.

Axes—  
First quality..... \$8.00 \$5.50  
Others..... 8.00

Note.—Jobbers often sell at lower  
prices than the above.

Axle Grease—See Grease, Axle.

Axles—  
No. 1, 4¢ @ 5¢, No. 2, 5¢ @ 6¢  
Nos. 7 to 14..... 5¢  
Nos. 15 to 18..... 7¢  
Nos. 19 to 22..... 7¢  
Concord Axles, loose collar..... 5¢  
Concord Axles, solid collar..... 7¢  
National Tubular Self-Oiling..... 35¢

Bag Holders.—See Holders, Bag.

Balances—  
Spring Balances..... 40¢  
No. 2000 20 30  
Chatillon, \$ dos \$0.30 0.95 1.75 net  
Chatillon Straight Balances..... 40¢  
Chatillon Circular Balances..... 50¢

Bars—  
Cast Steel..... 40¢  
Iron, Steel Points..... 50¢

Basins, Wash—  
Standard Fiberglass, No. 1, 10 1/2 inch, \$2;  
12 inch, \$2.25; 13 1/2 inch, \$2.75; 16 inch,  
\$3.25.

Beams, Scale—  
Scale Beams, List Jan. 12, '82..... 50¢  
Chatillon's No. 1..... 40¢  
Chatillon's No. 2..... 40¢  
Custer's..... 35¢

Beaters, Egg, &c—  
Keystone, P. D. & C., Each, No. 1, \$1; No.  
2, \$2..... 20¢  
Dover..... \$ dos \$1.50  
Duplex (Standard Co.)..... \$ dos \$1.25  
Rival (Standard Co.)..... \$ dos \$1.00  
Duplex Extra Heavy (Standard Co.)..... \$ dos \$3.50

Bells—  
Cow—  
Common Wrought..... 60¢  
Western..... 60¢  
Kentucky, "Star"..... 70¢  
Kentucky, Sargent's list..... 70¢  
Dodge, Genuine Kentucky..... 70¢  
Texas Star..... 60¢  
Call..... 40¢  
Farm Bells..... 35¢  
Steel Alloy Church and School Bells..... 40¢

Door—  
Gong, Abbe's..... 35¢  
Gong, Yankee..... 45¢  
Gong, Barton's..... 40¢  
Crank, Taylor's..... 25¢  
Crank, Brooks'..... 50¢  
Crank, Cone's..... 10¢  
Crank, Connel's..... 20¢  
Lever, Sargent's..... 20¢  
Lever, Taylor's Bronzed or Plated..... net  
Lever, Taylor's Japanned..... 25¢  
Lever, R. E. M. Co.'s..... 50¢  
Pull, Brook's..... 50¢  
Pull, Western..... 25¢

Electric—  
Wollensak's..... 20¢  
Bigelow & Dowse..... 20¢  
Taylor's..... 20¢

Hand—  
Light Brass..... 75¢  
Extra Heavy..... 65¢  
White Metal..... 60¢  
Silver Chime..... 35¢  
Globe (Cone's Patent)..... 25¢

Bellows—  
Blacksmiths'..... 60¢  
Molders'..... 40¢  
Hand Bellows..... 40¢

## Belting, Rubber—

Common Standard..... 70¢  
Standard..... 60¢  
Extra..... 60¢  
N. Y. B. & P. Co., Carbon..... 50¢  
N. Y. B. & P. Co., Diamond..... 40¢

Bench Stops—See Stops, Bench.

Benders, Upsetters, Tire.  
Stoddard's Lightning Tire Upsetters..... 15¢  
Detroit Perfected Tire Bender..... 15¢

Bits—  
Auger, Gimlet, Bit Stock, Drills, &c.,  
see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters,  
Blind.

Blind Fasteners—See Fasteners,  
Blind.

Blind Staples—See Staples, Blind.

Blocks—  
Ordinary Tackle, list May 20, 1889..... 50¢  
Cleveland Block Co., Mal. Iron..... 50¢  
Moore's Novelty, Mal. Iron..... 50¢

Bolts—  
Carriage, Machine, &c.—  
Com. list June 10, '84..... 70¢  
Genuine Eagle, list Oct. '84..... 75¢  
Phila. pattern, list Oct. 7, '84..... 80¢  
R. & W., old list..... 70¢  
Machine, list Jan. 1, 1890..... 75¢

Bolt Ends, list Jan. 1, 1890..... 75¢

Door and Shutter—  
Cast Iron Barrel, Square, &c..... 70¢  
Cast Iron Shutter Bolts..... 70¢  
Cast Iron Chain (Sargent's list)..... 65¢  
Ives' Patent Door Bolts..... 60¢  
Wrought Barrel..... 70¢  
Wrought Square..... 70¢  
Wrt Shutter, all Iron, Stanley's..... 60¢  
Wrt Shutter, Brass Knob..... 40¢  
Wrt Shutter, Sargent's list..... 55¢  
Wrt Sunk Flush, Sargent's list..... 50¢  
Wrt Sunk Flush, Stanley's list..... 55¢

Stove and Flow—  
Stove..... 60¢  
Flow..... 60¢  
R. B. & W. Flow..... 60¢

Tire—  
Common, list Feb. 28, '83..... 65¢  
Port Chester Bolt and Nut Company..... 65¢  
Empire, list Feb. 28, '83..... 65¢  
Keystone, Philadel., list Oct. '84..... 80¢  
Norway, Phila., list Oct. '84..... 75¢  
American Screw Company..... 75¢  
Norway, Phila., list Oct. 16, '84..... 75¢  
East, list Oct. 16, '84..... 75¢  
Philadel., list Oct. 16, '84..... 75¢  
Ray State, list Feb. 28, '83..... 65¢  
R. B. & W., Philadel., list Oct. 16, '84..... 80¢

Borers, Tap.  
Common and Blind..... 20¢  
Eley's Tap Bore..... 35¢  
Enterprise Mfg. Co..... 35¢  
Clark..... 35¢

Borax..... \$ 9¢ @ 10¢

Boring Machines—See Machines,  
Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.  
Per D..... 24¢

Braces—  
American Bit Brace Co.:  
Nos. 10, 15, 20..... 60¢  
Nos. 11, 21, 24, 27..... 70¢  
Nos. 22, 23, 25..... 70¢  
Nos. 13, 26, 30, 37..... 70¢  
Ball Braces, net..... \$1.12 to \$1.25

Amidon's  
Barker's Imp'd Plain..... 75¢  
Barker's Imp. Nickled..... 65¢  
Barker's..... 75¢  
Eclipse Ratchet..... 60¢  
Globe Jawed..... 40¢  
Corner Brace..... 40¢  
Universal, 8 in., \$2.10 10 in..... \$2.25  
Buffalo Ball..... \$1.10 @ \$1.16

Barber's  
Nos. 10 to 16..... 60¢  
Nos. 30 to 33..... 60¢  
Nos. 40 to 63..... 60¢  
Barker's  
Nos. 8, 10 and 12..... 75¢  
Plated, Nos. 8, 10 and 12..... 65¢  
Bartholomew's  
Nos. 25, 27 and 30..... 50¢  
Nos. 117, 118, 119..... 70¢  
Common Ball, American..... \$1.00 @ \$1.10  
Fray's Genuine Spotted's..... 50¢  
Fray's No. 70 to 120, 81 to 123, 307 to 414  
..... 60¢  
Ives' New Haven Novelty..... 70¢  
New Haven Ratchet..... 60¢  
Barber Ratchet..... 60¢  
Barbers..... 60¢  
Spotted..... 60¢  
Osgood's Ratchet..... 40¢  
P. S. & W. Co., Peck's Patent..... 60¢

Brackets—  
Shelf plain, Sargent's list, 55¢ @ 55¢  
Shelf, fancy, Sargent's list, 60¢ @ 60¢  
Reading, plain..... 50¢  
Reading, Rosette..... 50¢

Bright Wire Goods—See Wire.

Broilers—  
Hen's Self 1 inch..... 0 10 0x11  
Basting..... \$ Per dos \$4.50 5.50 6.50  
New Haven..... 50¢

## Buckets, Well.

Galvanized—  
Hill's..... \$ dos 12 qt, \$4.25; 14 qt, \$5.25  
Iron Clad..... \$ dos 14 qt, \$4.25 @ \$4.50  
Whiting's Flat Iron Band..... \$4.25 @ \$4.50  
Whiting's Wired Top..... \$ dos \$4.00 @ \$4.25

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers,  
Butchers'.

Butts—  
Brass—  
Wrought Brass..... 75¢  
Cast Brass, Tiebout's..... 50¢  
Cast Brass, Corbin's, Fast..... 33¢  
Cast Brass, Loose Joint..... 33¢

Cast Iron—  
Fast Joint, Narrow..... 50¢  
Fast Joint, Broad..... 50¢  
Loose Joint..... 50¢  
Loose Joint, Japanned..... 50¢  
Loose Joint, Jap. with Acorns..... 50¢  
Parliament Butts..... 70¢  
Mayer's Hinges..... 70¢  
Loose Pin, Acorns..... 70¢  
Loose Pin, Acorns, Japanned..... 70¢  
Loose Pin, Acorns, Japanned,  
Plated Tops..... 70¢

Wrought Steel—  
Fast Joint, Narrow..... 50¢  
Fast Joint, Broad..... 50¢  
Loose Joint, Broad..... 70¢  
Table Butts, Back Flaps, &c..... 70¢  
Inside Blind, Regular..... 70¢  
Inside Blind, Light..... 70¢  
Loose Pin..... 50¢  
Bronzed Wrought Butts..... 50¢

Calipers—See Compasses.

Calks, Toe—  
Gautier..... \$ 5¢ @ 6¢  
Dewicks (Burke)..... \$ 5¢ @ 6¢

Can Openers—See Openers, Can.

Cards—  
Horse & Curry..... 10¢  
Cotton..... 10¢  
Wool..... 10¢

Carpet Stretchers—See Stretchers,  
Carpet.

Carpet Sweepers—See Sweepers,  
Carpet.

Cartridges—See Ammunition.

Casters—  
Bed..... \$ 55¢ @ 55¢  
Plate..... \$ 55¢ @ 55¢  
Shallow Socket..... \$ 55¢ @ 55¢  
Deep Socket..... \$ 55¢ @ 55¢  
Yale Casters, list May, 1884..... \$ 55¢ @ 55¢  
Yale, Gem..... \$ 55¢ @ 55¢  
Martin's Patent (Phoenix)..... \$ 55¢ @ 55¢  
Payson's Anti-friction..... \$ 55¢ @ 55¢  
Giant Truck Casters..... \$ 55¢ @ 55¢  
Stationary Truck Casters..... \$ 55¢ @ 55¢  
Socket Truck Casters..... \$ 55¢ @ 55¢

Cattle Leaders—See Leaders, Cat-  
tle.

Chains—  
Trace, Wagon and Fancy Chains,  
list revised April 21, 1890..... 50¢  
American Coll, in cask lots,  
3-16 3-16 4-16 5-16 6-16 7-16 8-16 9-16 10-16 11-16 12-16 13-16 14-16 15-16 16-16 17-16 18-16 19-16 20-16 21-16 22-16 23-16 24-16 25-16 26-16 27-16 28-16 29-16 30-16 31-16 32-16 33-16 34-16 35-16 36-16 37-16 38-16 39-16 40-16 41-16 42-16 43-16 44-16 45-16 46-16 47-16 48-16 49-16 50-16 51-16 52-16 53-16 54-16 55-16 56-16 57-16 58-16 59-16 60-16 61-16 62-16 63-16 64-16 65-16 66-16 67-16 68-16 69-16 70-16 71-16 72-16 73-16 74-16 75-16 76-16 77-16 78-16 79-16 80-16 81-16 82-16 83-16 84-16 85-16 86-16 87-16 88-16 89-16 90-16 91-16 92-16 93-16 94-16 95-16 96-16 97-16 98-16 99-16 100-16 101-16 102-16 103-16 104-16 105-16 106-16 107-16 108-16 109-16 110-16 111-16 112-16 113-16 114-16 115-16 116-16 117-16 118-16 119-16 120-16 121-16 122-16 123-16 124-16 125-16 126-16 127-16 128-16 129-16 130-16 131-16 132-16 133-16 134-16 135-16 136-16 137-16 138-16 139-16 140-16 141-16 142-16 143-16 144-16 145-16 146-16 147-16 148-16 149-16 150-16 151-16 152-16 153-16 154-16 155-16 156-16 157-16 158-16 159-16 160-16 161-16 162-16 163-16 164-16 165-16 166-16 167-16 168-16 169-16 170-16 171-16 172-16 173-16 174-16 175-16 176-16 177-16 178-16 179-16 180-16 181-16 182-16 183-16 184-16 185-16 186-16 187-16 188-16 189-16 190-16 191-16 192-16 193-16 194-16 195-16 196-16 197-16 198-16 199-16 200-16 201-16 202-16 203-16 204-16 205-16 206-16 207-16 208-16 209-16 210-16 211-16 212-16 213-16 214-16 215-16 216-16 217-16 218-16 219-16 220-16 221-16 222-16 223-16 224-16 225-16 226-16 227-16 228-16 229-16 230-16 231-16 232-16 233-16 234-16 235-16 236-16 237-16 238-16 239-16 240-16 241-16 242-16 243-16 244-16 245-16 246-16 247-16 248-16 249-16 250-16 251-16 252-16 253-16 254-16 255-16 256-16 257-16 258-16 259-16 260-16 261-16 262-16 263-16 264-16 265-16 266-16 267-16 268-16 269-16 270-16 271-16 272-16 273-16 274-16 275-16 276-16 277-16 278-16 279-16 280-16 281-16 282-16 283-16 284-16 285-16 286-16 287-16 288-16 289-16 290-16 291-16 292-16 293-16 294-16 295-16 296-16 297-16 298-16 299-16 300-16 301-16 302-16 303-16 304-16 305-16 306-16 307-16 308-16 309-16 310-16 311-16 312-16 313-16 314-16 315-16 316-16 317-16 318-16 319-16 320-16 321-16 322-16 323-16 324-16 325-16 326-16 327-16 328-16 329-16 330-16 331-16 332-16 333-16 334-16 335-16 336-16 337-16 338-16 339-16 340-16 341-16 342-16 343-16 344-16 345-16 346-16 347-16 348-16 349-16 350-16 351-16 352-16 353-16 354-16 355-16 356-16 357-16 358-16 359-16 360-16 361-16 362-16 363-16 364-16 365-16 366-16 367-16 368-16 369-16 370-16 371-16 372-16 373-16 374-16 375-16 376-16 377-16 378-16 379-16 380-16 381-16 382-16 383-16 384-16 385-16 386-16 387-16 388-16 389-16 390-16 391-16 392-16 393-16 394-16 395-16 396-16 397-16 398-16 399-16 400-16 401-16 402-16 403-16 404-16 405-16 406-16 407-16 408-16 409-16 410-16 411-16 412-16 413-16 414-16 415-16 416-16 417-16 418-16 419-16 420-16 421-16 422-16 423-16 424-16 425-16 426-16 427-16 428-16 429-16 430-16 431-16 432-16 433-16 434-16 435-16 436-16 437-16 438-16 439-16 440-16 441-16 442-16 443-16 444-16 445-16 446-16 447-16 448-16 449-16 450-16 451-16 452-16 453-16 454-16 455-16 456-16 457-16 458-16 459-16 460-16 461-16 462-16 463-16 464-16 465-16 466-16 467-16 468-16 469-16 470-16 471-16 472-16 473-16 474-16 475-16 476-16 477-16 478-16 479-16 480-16 48



<b>Chucks.</b> Bench Pat. each, \$5.00.....20% Morse's Adjustable, each, \$7.00, 30@30@5% Danbury.....each, \$6.00, 30@30@5% Syracuse, Bala Pat.....25% Skinner's Patent Chucks.....33% Combination Lathe Chucks.....40% Universal Lathe Chucks.....40% Independent Lathe Chucks.....15% Drill Chucks.....15% Union Mfg. Co.,.....\$5.50, 25% Victor.....25% Combination.....40% Universal.....40% Independent.....40% <b>Churns.</b> Tiffin Union No. 1, 5 gallon.....\$3.25 each Tiffin Union No. 2, 7 gallon.....\$3.75 each Tiffin Union No. 3, 10 gallon.....\$4.25 each <b>Clamps.</b> R. I. Tool Co.'s Wrought Iron.....25% Adjustable, Cincinnati.....15@10% Adjustable, Hammers.....15% Adjustable, Steam's.....30@30@10% Steam's Adjustable Cabinet and Co. 40% ner.....30@30@10% Cabinet, Sargent's.....30@30@10% Carriage Makers, Sargent's.....70@10% Carriage Makers, P. S. & W. Co. 40@10% Eberhard Mfg. Co.....40@30@10% Warner's.....40@30@10% Saw Clamps, see Vices, Saw Filers..... Carpenters, Cincinnati.....25@10% <b>Cleavers.</b> <b>Butchers.</b> Bradley's.....25@30% L. & J. White.....20@5% Beatty's.....40@40@5% New Haven Edge Tool Co.'s.....40% P. S. & W.....33@45@33@45@10% Foster Bros.....40@10% Schulte, Loboff & Co.....40@40@5% <b>Clips.</b> Norway, Axle, 1/4 & 5-16.....55@25% 2nd grade Norway Axle, 1/4 & 5-16 55@25% Superior Axle Clips.....60@5% Norway Spring Bar Clips, 5-16, 60@5% Wrought-Iron Yellow Clips.....50% Steel Folio Clips.....50% Baker Axle Clips.....12% <b>Cloth and Netting, Wire-See Wire, &amp;c.</b> <b>Cockeyes.</b> .....50% <b>Cocks, Brass.</b> Hardware list.....50@25% <b>Coffee Mills-See Mills, Coffee.</b> <b>Collars, Dog, &amp;c.</b> Medford Fancy Goods Co.....40@10% Embossed, Gift, Pope & Steven's list.....30@10% Leather, Pope & Steven's list.....40% Brass, Pope & Steven's list.....40% Chapman Mfg. Company.....50@10@60% <b>Combs, Curry.</b> Fitch's.....50@10@50@10@10% Rubber, per doz \$10.00.....20% Perfect.....50% <b>Compasses, Dividers, &amp;c.-</b> Compasses, Calipers, Dividers, 70@70@10% Bemis & Call Co.'s..... Dividers.....60@5% Compasses & Calipers.....50@5% Wing and Inside or Outside.....50@5% Double.....60% (Call's Pat. Inside).....30% Excelsior.....50% J. Stevens & Co.'s.....35@10% Starrett's..... Spring Calipers and Dividers.....25@10% Lock Calipers and Dividers.....25% Combination Dividers.....25% <b>Coopers' Tools-See Tools, Coopers'.</b> <b>Cord, Sash.</b> Common.....P 10@11% Patent, good quality.....P 13@13% White Cotton Braided, fair.....P 28@28% Common Russian Sash.....P 13@13% Patent.....P 15% Cable Laid Italian Sash.....P 22@22% Indian Cable Laid.....P 13% Silver Lake..... A Quality, White, 50%.....10@10@5% A Quality, Drab, 55%.....10@10@5% B Quality, White, 60%.....25@30% B Quality, Drab, 55%.....31@33% C Quality, White (only).....20@28% Sylvan Spring, Extra Braided, White, 34% Sylvan Spring, Extra Braided, Drab, 34% Semper Idem, Braided, White, 30% Egyptian, India Hemp, Braided.....25% Samson..... Braided, White Cotton, 50%.....30@30@5% Braided, Drab Cotton, 55%.....30@30@5% Braided, Italian Hemp, 55%.....30@30@5% Braided, Linen, 50%.....30@30@5% <b>Corkscrews-See Screws, Cork.</b> <b>Corn Knives and Cutters-See Knives, Corn.</b> <b>Crackers, Nut.</b> Table (H. & B. Mfg. Co.).....40% Blake's Pattern.....P dos \$2.00, 10% Turner & Seymour Mfg. Co.....50% <b>Cradles.</b> Grain.....50@5@2@50@10@25% <b>Crayons.</b> White Crayons, P gr, 12@12%.....10% D. M. Stewart Mfg. Co., Metal Work- ers, P gr, \$2.50.....25% M. Stewart Mfg. Co., Rolling Mill,..... P gr, \$2.50.....25% See also Chalk. <b>Crow Bars-See Bars, Crow.</b> <b>Curry Combs-See Combs, Curry.</b> <b>Curtain Pins-See Pins, Curtain.</b>	<b>Cutters.</b> <b>Meat.</b> Dixon's W. dos.....40@25% Nos.....1 2 3 4 5 6 \$14.00 \$17.00 \$19.00 \$20.00 Woodruff's W. dos.....40@25% Nos.....100 150 \$15.00 \$18.00 Hales Pattern W. dos.....70@70@5% Nos.....11 12 13 \$27.00 \$33.00 \$45.00 American.....30% Nos.....1 2 3 4 5 6 Each.....\$5 \$7 \$10 \$25 \$50 \$60 Enterprised.....30% Nos.....12 13 22 33 42 Each.....\$3 \$2.50 \$4 \$6 \$15 Great American Meat Cutter.....30% Nos.....112 116 118 120 122 Each.....\$2.00 \$2.75 \$3.00 \$2.50 \$4.00 Miller Challenge W. dos.....45@45@10% Nos.....1 2 3 \$22.00 \$30.00 \$40.00 Home No. 1.....W. dos, \$26.00, 55@10% Draw Cut, each: Nos.....5 2 6 8 \$50 \$75 \$90 \$235.....30@25% Great American.....30% Beef Shavers (Enterprised).....30@10@30% Little Giant.....50% Chadborn's Smoked Beef Cutter, W. dos \$66.00 <b>Tobacco.</b> Champion.....20@10@30% Wood Bottom.....W. dos \$5.00@5.25 All Iron.....W. dos \$4.25 Nashua Lock Co.'s.....W. dos, \$18.00 50@55% Wilson's.....55% Sargents.....W. dos, \$24, 55@10% Acome.....W. dos \$20.00, 40% <b>Washer.</b> Smith's Pat. W. dos \$12.00, 30@10@10% Johnson's.....W. dos \$11.00, 33@4% Penny's W. dos Pol. \$14; Jap'd, \$16.00, 55% Appleton's.....W. dos \$16.00, 60@10% Bonney's.....30@10% Cincinnati.....25@10% <b>Cutlery.</b> Beaver Falls & Booth's.....33% Wostenholme.....\$7.75 to 2 <b>Dampers, &amp;c.</b> Dampers, Buffalo.....40@10% Buffalo Damper Clips.....40@10% Crown Damper.....40% Excelsior.....40@10% <b>Diggers, Post Hole, &amp;c.-</b> Samson Post Hole Digger, W. dos \$36.00, 25@10% Fletcher Post Hole Augers, W. dos \$36, 20% Eureka Diggers.....W. dos \$16.00@17.00 Lead's.....W. dos \$8.00@9.00 Vaughan's Post Hole Auger, W. dos \$13.00@14.00 Kohler's Little Giant.....W. dos, \$18.00 Kohler's Hercules.....W. dos, 15.00 Kohler's New Champion.....W. dos, 40.00 Schmidt's Diggers.....W. dos, \$18.00 Ryan's Post Hole Augers.....W. dos \$24.00 Cronk's Post Bars, W. dos \$60.00, 50@50@50@10% Gibbs Post Hole Digger, W. dos \$30.00, 50% Imperial, W. dos \$15.....45% <b>Dividers.</b> See Compasses. <b>Dog Collars-See Collars, Dog, &amp;c.</b> <b>Door Springs-See Springs, Door.</b> <b>Drawers.</b> Money, W. dos.....\$19@20 <b>Drawing Knives-See Knives, Drawing.</b> <b>Drills and Drill Stocks.</b> Blacksmiths'.....each \$1.75 Blacksmiths' Self-Feeding, each \$7.50, 20% Breast, P. S. & W.....40@10% Breast, Wilson's.....30@5% Breast, Millers Falls.....each \$3.00, 25% Breast, Bartholomew's.....each \$2.50, 25@10@40% Ratchet, Merrill's.....20@20@5% Ratchet, Ingelsoll's.....25% Ratchet, Parker's.....20@20% Ratchet, Whitney's.....30@10% Ratchet, Weston's.....20@25% Ratchet, Moore's Triple Action.....25@30% Ratchet, Curtis & Curtis.....30% Whitney's Hand Drill, Plain, \$11.00, 30@10% Wilson's Drill Stocks.....10% Automatic Boring Tools.....\$1.75@1.85 <b>Twist Drills.</b> Morse.....50@10@5% Standard.....50@10@5% Syracuse (Metal list).....50@10% Cleveland.....50@10@5% Williams.....50@10@5% New Process.....50@10@5% <b>Drill Bits.-See Augers and Bits.</b> <b>Drill Chucks.-See Chucks.</b> <b>Dripping Pans-See Pans, Dripping.</b> <b>Drivers, Screw.</b> Douglas Mfg. Co.....30@20@10% Dixson's.....40@10% Dixson's Pat. Excelsior.....45@10% Buck Bros.....30% Stanley B. & L. Co.'s..... Varnished Handles.....\$5@10% Black Handles.....60@10% Sargent & Co.'s..... No. 1 Forged Blade.....60@10@10% Nos. 20, 30 and 60.....60@10@10% P. S. & W.....60@10@10% Knap & Cowles.....60@10@10% No. 1 Extra.....60@10@10% Nos. 0, 4 &.....50@5@10@10% Stearns.....25@10@5% Gay & Parsons.....30% Champion.....25@10% Clark & F.....30@33@4% Crawford's Adjustable No. 1.....30% Ellrich's Socket and Ratchet.....30% Allard's Spiral, new list.....25% Kolb's Common Sense W. dos \$6.00, 35@10% Syracuse Screw-Drivers Bits.....30@30@5% Screw-Driver Bits.....W. dos, 50@5% <b>Screw-Driver Bits, Parr's.....W. gro \$6.25</b> Fray's Hol. Hds. Sets, No. 3, \$12.00, 25@25@10% P. D. & Co.'s all Steel.....50% Cincinnati.....25@10% Braze Screw Drivers.....25@10% Buck Bros.' Screw-Driver Bits.....%
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Roggin's Latches.....\$ doz 30¢@85¢  
 Bronze Iron Drop Latches.....\$ doz 70¢ net  
 Jap'd Store Door Handles—Nuts, \$1.63;  
 Plate, \$1.10; no Plate, \$0.88.....net  
 Barn Door, \$ doz \$1.40.....10¢10¢  
 Chest and Lifting.....70¢

## Wood—

Saw and Plane.....40¢10¢40¢10¢5¢  
 Hammer, Hatchet, Axe, Sledge, &c.....40¢  
 Brad Awi.....\$ gr 25.00  
 Hickory Firmer Chisel, ass'd.....\$ gr 4.50  
 Hickory Firmer Chisel, large.....\$ gr 5.00  
 Apple Firmer Chisel, ass'd.....\$ gr 5.00  
 Apple Firmer Chisel, large.....\$ gr 6.00  
 Socket Firmer Chisel, ass'd.....\$ gr 5.00  
 Socket Framing Chisel, ass'd.....\$ gr 5.00  
 J. S. Smith & Co.'s Pat. File.....50¢  
 File, assorted.....\$ gr 7.75  
 Auger, assorted.....\$ gr 5.00  
 Auger, large.....\$ gr 7.00  
 Pat. Auger, lvs.....\$ doz 10¢  
 Pat. Auger, Douglas.....\$ set \$1.25  
 Pat. Auger, Evans.....\$ set \$1.25  
 Hoe, Rake, Shovel, &c.....50¢10¢

## Hangers—

Barn Door, old patterns.....60¢10¢10¢70¢  
 Barn Door, New England.....60¢10¢10¢70¢  
 Barnson Steel Anti-Friction.....50¢  
 Orleans Steel.....55¢  
 Hamilton Wrought Wood Crank.....55¢  
 U. S. Wood Track.....65¢  
 Champion.....60¢10¢  
 Rider and Wooster, Medina Mfg. Co.'s  
 List.....70¢  
 Climax Anti-Friction.....60¢  
 Climax Anti-Friction for Wood Track.....50¢  
 Zenith for Wood Track.....55¢  
 Reed's Steel Arm.....50¢  
 Challenge, Barn Door.....50¢  
 Serling's Imp'vd (Anti-Friction).....65¢10¢  
 Victor, No. 1, \$15.00; No. 2, \$16.50; No.  
 3, \$18.00.....50¢25¢  
 Cheritree.....60¢10¢  
 Kidder's.....50¢10¢60¢  
 The Boss.....60¢10¢  
 Best Anti-Friction.....60¢10¢  
 Duplex (Wood Track).....60¢10¢5¢  
 Terry's Pat., \$ doz pr. 4 in, \$10.00; 5 in,  
 \$12.00.....50¢10¢  
 Terry's Steel Anti-Friction Leader 50¢10¢  
 Terry's Steel Anti-Friction Ideal 50¢10¢  
 Cronk's Patent, Steel Covered.....50¢5¢  
 Wood Track Iron Clad, \$ ft. 10¢.....60¢  
 15¢@60¢

Carrier Steel Anti-Friction.....50¢50¢5¢  
 Architect, \$ set \$6.00.....20¢  
 Eclipse.....20¢10¢  
 Felix, \$ set \$4.50.....20¢  
 Richards.....20¢@30¢10¢  
 Lane's Standard.....50¢5¢50¢10¢  
 Lane's New.....50¢5¢50¢10¢  
 Ball Bearing Door Hanger.....20¢10¢25¢10¢  
 Warner's Pat.....20¢10¢25¢10¢10¢  
 Stearns' Anti-Friction.....20¢10¢25¢10¢10¢  
 Stearns' Challenge.....25¢10¢25¢10¢10¢  
 Faultless.....40¢@40¢5¢  
 American.....\$ set \$6.00.....20¢10¢  
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Wire Brads & Nails; see Nails, Wire.  
Steel-Wire Brads, R. & E. Mfg. Co.'s  
List.....50&105

Tap Borers—See Borers, Tap.

Tapes, Measuring—

American.....33&39&45  
Spring.....405  
Chesterman's, Regular List.....35&305

Thermometers—

Tin Case.....80&80&105

Thimble Skeins—See Skeins.

Ties, Bale—Steel

Standard Wire, List.....60&10&55

Tinners' Shears, &c.—See Shears,  
Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, List  
Jan. 20 1887.....70&10&70&10&55

Tire Benders, Upsetters, &c.—  
See Benders and Upsetters, Tire.

Tools.

Coopers—  
Bradley's.....205  
Barton's.....20&30&55  
L. & J. White.....20&55  
Albertson Mfg. Co.....255  
Beatty's.....305  
Sandusky Tool Co.....30&30&55  
Shaves, Cincinnati Tool Co.....305

Lumber  
Ring Peavies, "Blue Line".....50 doz \$20.00  
Ring Peavies, Common.....50 doz \$18.00  
Steel Socket Peavies.....50 doz \$21.00  
Mail, Iron Socket Peavies.....50 doz \$19.00  
Cant Hooks, "Blue Line".....50 doz \$16.00  
Cant Hooks, Common Finish.....50 doz \$14.00  
Cant Hooks, Mail, Socket Clamp, "Blue  
Line" Finish.....50 doz \$16.00  
Cant Hooks, Mail, Socket Clamp, Com-  
mon Finish.....50 doz \$14.50  
Cant Hooks, Clip Clamp, "Blue Line"  
Finish.....50 doz \$14.00  
Cant Hooks, Clip Clamp, Common Fin-  
ish.....50 doz \$12.00  
Hand Spikes.....50 doz 6 ft., \$15.00; 8 ft.,  
\$20.00  
Pike Poles, Pike & Hook.....50 doz, 12 ft.,  
\$11.50; 14 ft., \$12.50; 16 ft., \$14.50;  
18 ft., \$17.50; 20 ft., \$21.50.  
Pike Poles, Pike only.....50 doz, 12 ft.,  
\$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18  
ft., \$16.00; 20 ft., \$20.00.  
Pike Poles, not ironed.....50 doz, 12 ft.,  
\$7.00; 14 ft., \$8.00; 16 ft., \$9.00; 18  
ft., \$12.00; 20 ft., \$16.00.  
Setting Poles.....50 doz, 12 ft., \$14.00; 14  
ft., \$15.00; 16 ft., \$17.00  
Swamp Hooks.....50 doz \$12.00

Saw  
Atkins' Perfection.....50 doz \$12.00  
Atkins' Excelsior.....50 doz \$6.00  
Atkins' Giant.....50 doz \$4.00

Tobacco Cutters—See Cutters, To-  
bacco.

Transom Lifters—See Lifters,  
Transom.

Traps—

Game—  
Newhouse.....40&40&55  
Oneda Pattern.....70&105  
Game, Blake's Patent.....40&10&55

Mouse and Rat—  
Mouse Wood Choker.....50 doz holes, 11&11&15  
Mouse, Round Wire.....50 doz \$1.50, 105  
Mouse, Cage, Wire.....50 doz \$2.50, 105  
Mouse, Catch-em-alive.....50 doz \$2.50, 155  
Mouse, Bonanza.....50 gr \$10.00, 105  
Mouse Delusion.....50 gr \$10.00&\$12.00  
Rat, Decoy.....50 gr \$10.00, 105  
Ideal.....50 gr \$10.00, 105  
Cyclone.....50 gr \$5.25  
Hotchkiss Metallic Mouse, Hole traps,  
50 doz, 909; in full cases, 50 doz.....755  
Hotchkiss Imp. Rat Killer.....50 gro \$18.50  
Hotchkiss New Rat Killer.....50 gro \$16.50  
Schuyler's Rat Killer.....50 gro \$16.00

Travels—

Lothrop's Brick and Plastering,  
20&10&5&855

Reed's Brick and Plastering.....155  
Dission's Brk and Plastering.....25&25&105  
Peace's Plastering.....255  
Clement & Maynard's.....205  
Rose's Brick.....15&205  
Brade's Brick.....255  
Worrall's Brick and Plastering.....205  
Garden.....705

Triers—

Butter and cheese.....255

Trimmers, Spoke.

Bonney's.....50 doz \$10.00, 505  
Stearns.....20&105  
Ives, No. 1, \$15.00; No. 2, \$12.00.....55&105  
Douglas.....50 doz \$9.00, 205  
Cincinnati.....255

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list, '82.....405

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine.....BC. R.  
No. 9, 14 and 18 Balls.....255 345  
No. 12, 14 and 18 Balls.....255 335  
No. 18, 14 and 18 Balls.....255 335  
No. 24, 14 and 18 Balls.....255 335  
No. 30, 14 and 18 Balls.....255 315  
No. 204, Matras, 14 and 18 Balls.....555  
Chalk Line, Cotton, 1/2 in Balls.....255  
Mason Line, Linen, 1/2 in Balls.....555  
2-Ply Hemp, 1/4 and 1/2 in Balls (Spring  
Twine).....155  
3-Ply Hemp, 1/2 in Balls.....155  
3-Ply Hemp, 1/4 in Balls.....155  
Cotton Wrapping, 5 Balls to 1.....105  
2, 3, 4 and 5-Ply Jute, 1/2 in Balls.....105  
Wool.....655  
Paper.....155  
Cotton Mops, 6, 9, 12 and 18 in to 105

Vices—

Solid Box.....50&10&50&10&55  
Fisher & Norris Double Screw.....15&105  
Stephens.....25&305  
Parker's.....30&255  
Wilson's.....555  
Howard's.....405  
Bonney's.....40&105  
Miller's Falls.....40&105  
Trenton.....40&50&105  
Merrill's.....15&205  
Sargent's.....50&10&105  
Backus and Union.....405  
Double Screw Leg.....15&105  
Frontis.....30&255  
Simmons' Adjustable.....305  
Moore's.....305

Saw Files—

Bonney's, Nos. 2 & 3, \$15.00.....40&105  
Stearns.....33&40&55  
Stearns' Silent Saw Files.....33&40&55

Sargent's.....605&105  
Hopkins.....50 doz \$17.50, 105  
Reading.....50&105  
Wentworth.....50&105  
Combination Hand Vices.....50 gr \$42.00  
Cowell Hand Vices.....305  
Bauer's Pipe Vices.....105  
Cincinnati.....35&105

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters,  
Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.

Cast Iron, Hollow—

Stove Hollow-Ware—

Ground.....55&55&60&55  
Unground.....65&105&65&10&55

White Enameled Ware—

Mashin Kettles.....50&10&105  
Boilers and Saucepans.....40&55  
Tinned Boilers and Saucepans.....40&55  
Rustless Hollow-Ware.....50&50&55  
Gray Enameled Ware—

Stove.....505  
Mash Kettles.....60&10&105  
Boilers and Saucepans.....40&55

Enameled—

Agate and Granite Ware, list Jan. 1,  
1880.....33&40&105  
Ironclad Enameled Ware.....dis 33&40&105

Kettles—

Galvanized Tea-Kettles—

Inch.....6 7 8 9  
Each.....55¢ 60¢ 65¢ 75¢

Standard Fiber—

Wash-Basins, 10 1/2 in.....\$2.00  
Wash-Basins, 12 in.....2.25  
Kettles, 11 1/2 in.....4.00  
Cuspidors.....8.00  
Spittoons, "Daisy," 8 in.....4.00  
Peck Measure.....4.00  
Half-Peck Measure.....3.50

See also Falls.

Indurated Fiber—255

Spittoons, No. 2, 5 doz.....\$9.00  
Basins, Ringed, 5 doz, No. 2, \$4.80;  
No. 3.....\$4.20  
Washbasins, Nos. 0, 1, 2 and 3 (4  
pieces), 5 nest.....\$7.50  
Kettles, Nested, Nos. 1, 2, 3 and 4 (4  
pieces), 5 nest.....\$3.70  
Butter Bowls 15, 17 and 19-inch (3  
pieces), 5 nest.....\$2.25  
Liquid Measures, pt., qt., 2 qt. and fun-  
nel (4 pieces) 5 set.....\$5.00  
Dry Measures, 1, 2, 4, 8 and 16 qts. (5  
pieces), 5 set.....\$3.00

See also Falls.

Silver Plated, Hollow—

1 mo. or 5 1/2 cash in 30 days.

Meriden Britannia Co.....40&55  
Simpson, Hall, Miller & Co.....40&55  
Rogers & Brother.....40&55  
Hartford Silver Plate Co.....40&55  
William Rogers Mfg. Co.....40&55

Washers—

Size.....1/2 5-16 3/8 1/2 3/4 1  
Washers.....6 1/2 3/4 1/2 3/4 1  
In lots less than 200, 5 doz, add 1/4, 5-5  
boxes 1¢ to list.

Wedges—

Iron.....50 doz \$3.50  
Steel.....50 doz \$4.50

Weights, Sash—

Solid Eyes.....50 ton \$18&610

Well Buckets, Galvanized—See

Buckets, Well, Galvanized.

Wheels, Well.

8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25

Wire and Wire Goods—

Iron—

Market.

Br. & Ann., Nos. 0 to 18.....72&45  
Cop'd, Nos. 0 to 18.....705  
Galv., Nos. 0 to 18.....62&45  
Tin'd, Tinned list Nos. 0 to 18.....62&45

Stone.

Br. & Ann'd, Nos. 16 to 18.....72&45  
Bright and Ann'd, Nos. 19 to 20.....755  
Br. & Ann'd, Nos. 27 to 30.....77&45

Tinned.

Tinned Brown Wire, 18 to 21, 5 doz.....51&45  
Galvanized Fence, Nos. 8 and 9.....655  
Annealed Fence, Nos. 8 and 9.....755  
Annealed Grade, Nos. 10 to 14.....785  
Brass, list Jan. 18, 1884.....255  
Copper, list Jan. 18, 1884.....255  
Barb Fence.....See Trade Report  
Annealed Wire on Spools.....505  
Mallin's Steel and Tin'd on Spools.....405  
Mallin's Brass and Cop. on Spools.....405  
Cast Steel Wire.....505  
Stub's Steel Wire.....50.00 to 2, 305  
Steel Mute Wire, Nos. 12 to 30, 555  
Picture Wire.....New list 505  
Wire Clothes Lines, see Lines.

Bright Wire Goods—

Standard list.....355

Wire Cloth and Netting.

Painted Screen Cloth, good quality,  
100 sq. ft., \$1.00 to \$1.75

Galvanized Wire Netting.....70&10&755

Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable.....405  
Boxer's Adjustable "S".....40&10&55  
Baxter's Diagonal.....40&10&55  
Coe's Genuine.....50&55  
Coe's "Mechanics".....50&10&55  
Girard Standard.....65&105  
Lamson & Sessions' Engineers'.....60&105  
Lamson & Sessions' Standard.....70&105  
P. B. & W. Agricultural.....75&75&10  
Girard Agricultural.....75&75&10  
Lamson & Sessions' Agric'l.....75&75&10  
Bemis & Call's  
Pat. Combination.....355  
Merrick's Pattern.....355  
Bryant's Pattern.....355  
Cylinder or Gas Pipe.....50&105  
No. 3 Pipe.....50&105  
Aiken's Pocket (Bright).....30.00, 50&105  
The Favorite Pocket.....50 doz \$4.00, 405  
Webster's Pat. Combination.....255  
Boardman's.....30&105  
Always Ready.....505  
Alligator.....30&105  
Donohue's Engineer.....30&105  
Acme, Bright.....60&25  
Acme, Nickleod.....50&25  
Walker's.....55&25  
Diamond Steel.....55&25  
Cincinnati Brace Wrenches.....55&105  
Tate's Vise Wrench.....55&105

Wringers, Clothes—

List March 11, 1880, 25 cash.

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1885,  
50&15&855

## PAINTS, OILS AND COLORS.—Wholesale Prices.

### Animal and Vegetable Oils.

Linseed, City, raw, per gal. 62 @ 64  
Linseed, City, boiled.....64 @ 66  
Linsed, Western, raw.....60 @ 60  
Lard, City, Extra Winter.....50 @ 51  
Lard, City, Prime.....49 @ 50  
Lard, City, Extra No. 1.....45 @ 46  
Lard, City, No. 1.....42 @ 43  
Lard, Western, prime.....49 @ 50  
Cotton-seed, Crude, prime.....33 @ 35  
Cotton-seed, Crude, of  
grades.....28 @ 30  
Cotton-seed, Summer Yel-  
low, prime.....36 @ 36 1/2  
Cottonseed, Summer Yel-  
low, off grades.....31 @ 33 1/2  
Sperm, Crude.....57 @ 59  
Sperm, Natural Spring.....72 @ 74  
Sperm, Natural Winter.....74 @ 77  
Sperm, Bleached Winter.....79 @ 82  
Whale, Crude.....45 @ 45  
Whale, Natural Winter.....49 @ 51  
Whale, Bleached Winter.....51 @ 52  
Whale, Extra Bleached.....54 @ 55  
See Elephant, Bleached  
Winter.....60 @ 62  
Menhaden, Crude, Sound.....23 @ 24  
Menhaden, Crude, Southern  
Menh den, Light Pressed.....26 @ 28  
Menhaden, Bleached Wter.....32 @ 33  
Menhaden, Extra Bleached.....35 @ 36  
Tallow, City, prime.....45 @ 46  
Tallow, Western, prime.....45 @ 46  
Cocoonut Ceylon.....64 @ 64  
Cocoonut, Cochiti.....64 @ 64  
Cod, Domestic.....82 @ 82  
Cod, Foreign.....83 @ 84  
Red Elaine.....44 @ 44  
Red Saponified.....44 @ 44  
Bank.....25 @ 25  
Olive, Italian, bbls.....80 @ 83  
Seafoat, prime.....52 @ 52  
Palm, prime, Lagos.....54 @ 54

### Mineral Oils.

Black, 20 gravity, 25 @ 30  
cold test.....per gal 3 @ 9  
Black, 30 gravity, 15 cold  
test.....34 @ 34  
Black, 30 gravity, summer  
Cylinder, light, filtered.....@

Cylinder, dark, filtered.....14 @ 20  
Cylinder, dard, 4'tm refined  
Paraffine, 23 1/2 @ 24 gravity.....11 @ 12  
Paraffine, 25 gravity.....10 @ 11  
Paraffine, 28 gravity.....8 1/2 @ 9  
Paraffine, red, 21 @ 22 grty.....14 @ 14 1/2  
Paraffine, red, 22 1/2 @ 23 grty.....12 @ 13

### Paints and Colors.

Barytes, Prime White.....50 ton \$22.00 @ \$22.50  
Barytes, Amer. refined.....20.00 @  
Barytes, Amer. No. 1.....16.00 @  
Barytes, Amer., off-color.....13.00 @ 15.00  
Blue, Celestial.....5 1/2 @ 7 1/2  
Blue, Chinese.....45 @ 50  
Blue, Prussian.....20 @ 25  
Blue, Ultramarine.....7 @ 25  
Brown, Spanish.....1 1/2 @ 1 1/2  
Brown, Vandyke, Amer.....3 @ 3 1/2  
Brown, Vandyke, English.....8 @ 8  
Black, American Drop.....8 @ 10  
Black, English Drop.....12 @ 14  
Black, Frankfurt, Drop.....5 @ 18  
Black, Lamp, common.....12 @ 18  
Black, Lamp, medium.....12 @ 25  
Black, Lamp, prime.....27 @ 33  
Carmine, No. 40, in bulk, 3.10 @  
or barrels.....3.20 @  
Carmine, No. 40, in ounce  
bottles.....4.20 @  
Chalk, in bulk.....2.00 @ 2.50  
Chalk, in bbls.....100 @ 30 @ 35  
China Clay, English.....@  
China Clay, Southern.....10.00 @ 11.50  
Cobalt Oxide, prep'd.....2.90 @  
Cobalt Oxide, black.....@  
Cobalt Oxide, black.....lots 1000 2.60 @  
Cobalt, Oxide, black.....less 1000 2.65 @  
Crocods Martius, Engl. W. B.....1 1/2 @ 3 1/2  
Crocods, American.....1 1/2 @ 2 1/2  
Green, Paris, in bulk.....14 @ 14 1/2  
Green, Paris, 170 @ 175 lb.....14 @ 15  
Green, Paris, small pack.....10 @ 21  
Green, Chrome, ordinary.....8 @ 13  
Green, Chrome, pure.....22 @ 25  
Lead, Eng., B.B. white.....9 @ 10  
Lead, Amn. White, dry or in oil:  
Kegs, lots less than 1000 lb.....@ 7  
Kegs, lots 1000 lb to 5 tons.....@ 6 1/2

Kegs, lots 5 tons to 12 tons.....@ 6 1/2  
Kegs, lots 12 tons and over.....@ 6 1/2  
Lead, White, in oil, 25 lb tin  
pails, add to keg price.....@ 1/2  
Lead, White, in oil, 12 1/2 lb tin  
pails, add to keg price.....@ 1  
Lead, White, in oil, 1 to 5 lb as-  
sorted tins, add to keg price.....@ 2 1/2  
Lead, Red, bbls, add 1/4 bbl.....@ 6 1/2  
Lead, Red, kegs.....6 1/2 @ 7  
Litharge, kegs.....6 1/2 @ 7  
Litharge, bbls, and 1/4 bbls.....@ 6 1/2

TERMS, &c.—Lead and Litharge.—On  
lots of 1000 lb or over, 30 days' time or  
2 1/2 % discount for cash if paid within 15  
days of date of invoice.

Ocher, Rochelle.....1.35 @ 1 1/2  
Ocher, French Washed.....1 1/2 @ 2 1/2  
Ocher, German Washed.....1 1/2 @ 3  
Ocher, American.....1 1/2 @ 1 1/2  
Orange Mineral, French.....9 @ 9 1/2  
Orange Mineral, German.....8 1/2 @ 9 1/2  
Orange Mineral, American.....8 @ 8 1/2  
Paris White, English Cliff-  
stone.....90 @ 1.10  
Paris White, American.....70 @ 80  
Red, Indian, English.....5 1/2 @ 7  
Red, Indian, American.....3 @ 6  
Red, Turkey.....9 @ 14  
Red, Tuscan.....9 @ 11  
Red, Venetian, America.....@ 105  
Red, Venetian, England.....1.00 @ 1.15  
Sienna, Italian, Burnt.....5 @ 6 1/2  
Sienna, Ital., Burnt Lumps.....1 1/2 @ 3 1/2  
Sienna, Ital., Raw, Powd.....5 @ 6 1/2  
Sienna, Ital., Raw Lumps.....3 @ 3 1/2  
Sienna, American, Raw.....1 1/2 @ 1 1/2  
Sienna, American, Burnt  
and Powdered.....1 1/2 @ 1 1/2  
Talc, French.....1 1/2 @ 1 1/2  
Talc, American.....1 @ 1 1/2  
Terra Alba, Fr'ch, 100 lb.....72 1/2 @ 80  
Terra Alba, English.....80 @ 85  
Terra Alba, American No. 1.....70 @ 75  
Terra Alba, American No. 2.....38 @ 40  
Umber, Turkey, Bnt. and  
Powd.....5 1/2 @ 4  
Umber, Turkey, Raw and  
Powdered.....3 1/2 @ 3  
Umber, Turkey, B'w Lumps.....3 1/2 @ 3 1/2  
Umber, Turkey, Bnt. Amer.....1 1/2 @ 1 1/2

Umber, Turkey, B'w Amer.....1 1/2 @ 1 1/2  
Yellow, Chrome.....10 @ 25  
Vermilion, Americ.....11 1/2 @ 13  
Vermilion, Quicks'er, bulk.....@ 75  
Vermilion, Quicks'er, bags.....@ 78  
Vermilion, Quicksilver,  
smaller pkgs.....@ 80  
Vermilion, English Import.....85 @ 85  
Vermilion, Imitation, Eng.....8 @ 25  
Vermilion, Trieste.....75 @ 80  
Vermilion, Chinese.....88 @ 90  
Whiting, Common, 100 lb @ 45  
Whiting, Gliders.....50 @ 55  
Zinc, American, dry.....3 1/2 @ 4 1/2  
Zinc, French, Red Seal.....@ 74  
Zinc, French, Green Seal.....@ 74  
Zinc, French, V. M. X.....@ 74  
Zinc, Antwerp, Red Seal.....@ 74  
Zinc, Antwerp, Green Seal.....@ 74  
Zinc, German, L. Z. O.....@ 74  
Zinc, V. M. in Poppy Oil, G.  
Seal, lots of 1 ton and  
over.....10 1/2 @ 10 1/2  
Zinc, V. M. in Poppy Oil,  
Red Seal.....@ 10  
lots of 1 ton and over.....@ 10  
lots of less than 1 ton.....9 1/2 @ 10 1/2

Discounts.—French Zinc.—Discounts  
to buyers of 10 bbl. lots of one or as-  
sorted grades: 1 1/2 % 25 bbls, 2 1/2 % 50 bbls,  
3 1/2 % No discount allowed on less  
than bbl. lots.

### Colors in Oil.

Blue, Chinese.....25 @ 40  
Blue, Prussian.....29 @ 45  
Blue, Ultramarine.....12 @ 18  
Brown, Vandyke.....7 @ 12  
Green, Chrome.....8 @ 13  
Green, Paris.....15 @ 18  
Sienna, Raw.....7 @ 13  
Sienna, Burnt.....7 @ 10  
Umber, Raw.....7 @ 10  
Umber, Burnt.....7 @ 10  
Glue.  
Low Grade.....12 @ 14  
Cabinet.....12 @ 14  
Medium White.....13 @ 15  
Extra White.....17 @ 20  
French.....9 @ 20  
English.....10 @ 15  
Irish.....12 @ 15

